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A HANDBOOK

OF

LOCAL THERAPEUTICS

GENERAL SURGERY, BY RICHARD H. HARTE, M.D.,

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DISEASES OF THE EAR AND AIR-PASSAGES, BY HARRISON ALLEN, M.D.,

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EDITED BY

HARRISON ALLEN, M.D.

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PREFACE.

A number of circumstances induced the authors to undertake the preparation of this book. It was known that no text was available in which the local actions of drugs were not subordinated to their general actions. In the lines of special medicine, as represented in General Surgery, Dermatology, Otology, Rhinology, Laryngology, and Ophthalmology, it was believed that the topical uses of drugs are among the most important to which they can be put, and that statements concerning them from experienced practitioners would be acceptable to the profession. It was further assumed that the changes brought about by the theories of asepsis had made it desirable that the entire range of local medicaments be revised.

Of late years, through the extraordinary activity of chemists, the number of agents which affect tissues locally has been greatly increased. Many of these substances are yet on trial. To present a succinct account of their sources and properties would appear to be a useful effort.

The book is intended more as a guide to treatment than as a disquisition on local medication. Conceding the value of many new drugs, the authors have faith in the judgments of the older practitioners who secured good results from limited resources. Neither have remedies of the household been ignored, as really valuable hints for local treatment may be gleaned from among them.

While it is acknowledged that errors of judgment may have been committed in excluding some drugs whose properties have been praised, a greater error would have been to endorse imperfectly attested novelties.

The divisions of the main subjects are seen occasionally to overlap. It is hoped that the instances in which this occurs will tend to reinforce the teaching rather than to weaken it. Procedures are noted which are usually treated of in books on minor surgery (as in the account of fixation of dressings); as well as descriptions of the systematic actions of drugs (as in lard and the actions of fats). "Anesthetics" and "bleeding" it must be conceded are on the border line between local and general therapeutics.

Since a book on the local actions of drugs will be naturally used for reference, the plan of the United States Pharmacopœia has been followed, and when practicable, definitions have been quoted from this authority. But it was not thought always advisable to accept so admirable a guide. Thus petroleum is taken as a general heading, under which the sub-titles rhigolene, kerosene, petrolatum, and paraffin appear.

It would have been easy, with the facilities at hand, to load the book with literary references, but none have been made except to give honor where honor is due, and to invite the reader to consult original communications.

The latest authorities have been followed in the spelling of technical words. For the most part the final "e" of terms such as glycerin and gelatin has been dropped. The names of unofficial preparations so far as possible are left in the forms selected by the authors cited. Thus the formulæ for medicated cottons are embraced under the name of "cotton-wools," as designated by Woakes.

Each author is responsible for special statements made by him, while the authors unite in approval of all general statements. With a full appreciation of the importance of the intricate and varied information conveyed, they resolved to submit all pharmaceutical and chemical statements to rigid scrutiny. They deem themselves fortunate in having obtained for the pharmaceutical data a critical revision at the hands of Dr. George I. McKelway, Obstetrician and Gynecologist to the Philadelphia Hospital, whose experience, first as a pharmacist and afterward as a physician, renders his aid peculiarly acceptable; and for the chemical data the assistance of Henry Trimble, Professor of Analytical Chemistry, Philadelphia College of Pharmacy. As the sheets have passed through the press they have been carefully revised by the latter, especially as to the composition of many of the recently announced preparations.

The authors are indebted to many sources for information. Dr. Allen wishes especially to acknowledge courtesies received from W. E. Casselberry, of Chicago; S. H. Chapman, of New Haven; S. Solis-Cohen and James Truman, of Philadelphia; S. Johnston, of Baltimore; F. Hinkle, of Buffalo; and E. L. Shurly, of Detroit. Messrs. Frank E. Morgan and Henry A. Borell, of Philadelphia, rendered valuable aid in giving the composition of unofficial formulæ.

The carefully prepared index is the work of Dr. Thomas F. Branson, Resident Physician of the Pennsylvania Hospital.

INTRODUCTION.

On the Local Action of Remedies.—Since much of the success of local medication depends upon the method adopted and the manner in which details are carried out, the following general comments may prove useful:—

(1) All forms of inspissated secretions, desquamations and filth are in themselves exciting causes of disease; therefore the selected lotion, unguent, or powder is not to be applied until surgical cleanliness is secured. The skin is to be freed from detritus and fat, and, so far as is practicable, the mucous membrane from mucus. The surface, if that of an ulcer, should be cleansed of exudates.

(2) In congestion it must remain a matter of judgment whether or not to deplete the blood-vessels before the employment of an anodyne or an astringent. It is certainly true that an agent will often fail on a region where the smaller vessels are constricted when it will succeed on one where they are of normal diameter or even dilated.

(3) It is necessary to remember that agents act in exact correlation to the structures to which they are applied. Bone, periosteum, or the mucous membrane covering the alveolar processes and the roof of the mouth, must be attacked by stronger preparations than are safe to be used on the conjunctiva or the urethra. Even different regions of the general skin surface demand that discrimination be exercised in the choice of strength of remedies. To enforce the value of this remark, it is only necessary to contrast such localities as the sole, the palm, the scalp, and the region of the nape of the neck, with the scrotum, the perineum, the eyelids, and the mammæ. A drug may excite in the one instance, but excoriate or destroy in the other.

(4) Unless the constringing effect of cold be especially indicated, local applications should be of the temperature of the body, or slightly above it. Elevation of temperature may make the difference between success and failure. As a rule, all inhalations should be warm. Lotions to the nostrils and the throat are almost always increased in efficacy if the temperature is raised to 140° F.

(5) The local uses of drugs, other than those which act as germicides, are subject to sharp limitations. Few of them are free from evil effects

consequent upon prolonged use. It is well to recall the possibility of undue absorption of the agent, as in the case of nitrate of silver, and that the parts may become accustomed to the first impression made upon them, and no longer respond. In the case of astringents and excitants, it is best to begin with mild formulæ, and if the case does not improve steadily, to increase the strength of the drug or exchange it for another of the same group. Emollients are often abused. Warm water dressings, poultices, etc., when long continued do more harm than good. The evils arising from the undue action of cold are universally recognized. Over use of stimulating applications often occurs in the treatment of chronic inflammation of the mucous surfaces.

The use of drugs which entail habit-effects, such as opium, cocaine, ether, chloroform, etc., must be carefully watched.

Remedies which are interchangeable are termed *succedanea*. An extensive range of succedanea in the possession of the physician naturally increases his resources.

(6) The recognition of conditions under which the processes of the economy are conducted is essential to the intelligent use of many local remedies. Special reference is here made to those which act by imbibition, osmosis, and digestion.

(7) The value of inunction is increased by gentle *rubbing* and *friction*; by well-directed *pressure*, as shown in the use of the tampon and bougie in the nasal passages, the uterus and the vagina; by still more persistent yet equable force, as that exerted by a bandage firmly adjusted to a limb; or even by a heavy weight, such as that of a sand-bag on the groin. Remedies whose actions are thus controlled will accomplish results which are sought for in vain when they are independently exhibited.

Even the aid of electricity is called into play to secure the absorption of recalcitrant medicines. *Cataphoresis*, or anodal diffusion, which are the terms given to this phenomenon, demands especial notice. B. W. Richardson (*Med. Times and Gaz.*, 1859) described under the name of "voltaic narcotism" phases of local anæsthesia determined by an electrical current. Solutions of morphine, aconitin, and chloroform were used. Hermann Munk (*Arch. f. Anat. und Physiol.*, 1873) placed the subject of cataphoresis upon a scientific basis. Valuable clinical contributions have appeared in this country, notably papers by F. Peterson (*Med. Rec.*, January 31, 1891) (from whose writings this account is condensed), and J. L. Corning (*N. Y. Med. Journ.*, November 6, 1886). The chief drugs used for local anæsthetic impressions are cocaine hydrochloride, chloroform, and aconitin in the treatment of NEURALGIA and for minor operations on the skin. Iodide of potassium, iodide of lithium, and diluted tincture of iodine have been successfully exhibited in the treatment of SYPHILIS. Peterson extols the use of salts of lithium—notably, the chloride, the benzoate, and the citrate—for RHEUMATISM and GOUTY SWELLINGS. Among mercurials, the imidosuccinate and the bichloride may be mentioned.

The following tentative classification of the action of local remedies may be found useful.

All remedies act locally. (1) By restoring the normal functions, *e. g.*, by *stimulating* the blood to flow through a congested region, or by *exciting* gland-action and thus promoting secretion.

(2) By *protecting* a denuded surface, thus giving it rest. A protectant is also of use in excluding microbes and irritating constituents of the atmosphere.

(3) By means of *absorption* from the surface; thus constricting the small blood-vessels and checking hemorrhage; producing changes in the iris by instillation in the conjunctival sac; creating anodyne impressions on peripheral nerve-ends for the relief of pain; inducing counter-irritation and transudation of serum, as in the action of vesicants.

(4) By *destroying* tissues, as in the action of caustics.

But since remedies are rarely simple in their actions, a few remarks on the more important of these are here introduced.

The action of *astringents* is complex in the effects upon mucous surfaces. The first effect, doubtless, is to coagulate the albumin; the second is to constrict the arterioles; the third is to excite the parts. A fourth and less evident effect than the foregoing is to cauterize the tissues. All the more powerful astringents are thus caustic in full strength when applied to delicate structures, such as polypoid growths of the middle ear. The list of caustics would be greatly increased if all the agents which had such destructive effects were herein enumerated.

Astringents also probably act by direct excitation of terminal nerve filaments. When used in strong solution, or in excess, it is easy to discern why an astringent may become an irritant. The coagula are somewhat dense and not always easily removed; they may light upon sensient surfaces and behave as foreign bodies. It is well, therefore, after the use of astringents (especially on a mucous surface) to flush the parts carefully with a neutral or slightly alkaline solution. Care must be taken to prevent destruction of the olfactory regions by the indiscriminate use of astringents. Astringents are not easily dissolved in an oily fluid. (See *Iodo-Tannin.*)

The secretion of mucous glands tends to macerate and in a measure to remove exudations; not only is this the case, but the local remedy, especially if it be of an astringent character, acts upon the secretion by coagulating the albumin, thus converting a transparent, varnish-like, tenacious liquid, which covers the tissues with a uniform layer, into a white and opaque mass, enabling the physician to readily remove it. It is probably owing to this fact—namely that most astringents coagulate albumin—that this group of agents is of such marked value in the treatment of catarrh. While hæmostatics constrict the vessels in the region to which they are applied, they in some instances excite vasomotor reflexes by which vessels can be constricted in a remote region. For example, cold applied to the skin of the back of the neck is well known to have a tendency to constrict smaller blood-vessels in the nose or lungs and thus aid in arresting an attack of epistaxis or hæmoptysis. Wet compresses to the skin of the side of the throat are useful in controlling inflammation of the mucous membrane of the mouth and pharynx.

Alkalies in weak solution, besides acting as solvents of tenacious mucus, are often germicides, as is seen in the destruction of the microbe of APHTHÆ. It is probably true that they thus prove useful in controlling superficial inflammations and in favorably modifying catarrhal states.

Concentrated preparations of alkalies are *caustic*, as, indeed, are most of those agents which in general therapeutics are classed as alteratives. Alkalies, by their affinity for water and their solvent action on tissues, act mainly by abstracting the water and will destroy skin or other structures to a considerable depth. Caustic alkalies are more solvent and destructive than the remaining members of the group. They possess widely diffusive power.

The term *solvent* (dissolvent), while one convenient to use is not of much significance in describing the action of a remedy; ordinarily it implies the conversion of a solid (unabsorbable) into a liquid (absorbable) form—as the dissolving of a concretion by an acid; but it often implies *diluting* an inspissated or tenacious secretion or exudate. It is evident that the normal secretions may thus dilute, as well as lotions or other watery preparations. *Digestive solvents* act in the presence of animal ferments.

General Remarks on the Methods of Using Remedies.— Among the methods of using local remedies may be named the following:—

Powders blown upon the affected part (applied particularly to the use of "snuff") are said to be *insufflated;* when flirted on an exposed surface they are said to be *dusted.*

When a fluid is broken up to form a fine vapor, it is said to be *vaporized* ("nebulized"). Many vaporized fluids are volatile. When a current is broken up to form a relatively coarse medium it is said to be *atomized*. Atomized particles of water are thrown with the force of compressed or heated air by appropriate apparatus termed *atomizers* or *sprayers*.

The use of smoke when inhaled constitutes *fumigation*, though this term is also employed to express the application to the skin of a volatile disinfectant, and to describe the use of vaporized mercury in the treatment of SYPHILIS. The local application of an oil or fat constitutes *inunction*.

The use of *brushes* in dusting powders or applying lotions and pigments has given way in great measure to the employment of *dossils* (*pledgets*) of cotton. These are much more cleanly, and are practically without cost. Cotton in its various forms and fabrics is extolled by modern writers for many uses in local medication. (See *Gossypium*.) Medicated cottons (often spoken of in the text as "cotton-wools") meet numerous indications in the form of *tampons*. In like manner the use of *sponges* as *tents* and absorbent dressings has been largely superseded.

A liquid when used to lave a large surface is called a *lotion*; when for receiving the body it constitutes a *bath;* when used in establishing a continuous flow (irrigation), as in flushing the ear, nasal chambers, the uterus, vagina, etc., it is described as a *douche;* when especially adapted to *rinsing* the mouth and pharynx it forms a *gargle;* when used as a *paint* it forms a *pigment*. While convenient for domestic use the douche can be a mischievous agent, especially in the treatment of the nasal passages and the external ears. Otitis media has been often induced by the first-mentioned use and vertigo and pain by the last. If used at all it needs the utmost caution. The body of water in the receiver is often too large and placed too high. No greater degree of pressure on the current in the nozzle should be permitted than is demanded to secure a return flow.

Pigments may be either oily or aqueous, though it is more common to speak of *anointing* when an oily substance is applied in bulk.

An *ointment* is "a topical application of such consistence that it may be easily rubbed on the skin, becoming gradually liquefied." (*Nat. Med. Dictionary.*) A fatty base is assumed.

The use of the term *paste* is reserved for a mass of the consistence of an ointment, which is for the most part a convenient means of controlling the effects of powerful caustics. (See *Vienna Paste, London Paste, Conquoin's Paste.*)

General Remarks on the Uses of Ointments, Plasters, Douches, etc., in General Surgery.—*Ointments* and *cerates* are not now employed to the same extent in surgical therapeutics as formerly, although when skillfully used they are valuable agents. Like many helpful topical applications, they have been abused. All varieties of bases or fatty substances have been employed for making ointments, but lard, petrolatum, and lanolin are now usually preferred. Whatever base is selected it must be fresh and of the best quality. Care should be exercised that when medicinal agents are added thereto they should be in the finest possible state of subdivision and free from particles of "grit," etc. When extracts are added, if not uniformly soft they should be made so by trituration with water or alcohol, according to their nature. When properly made an ointment should be of the consistence of butter at a temperature of 60° F., and when placed in contact with the body should gradually soften. Many ointments if kept long become rancid, which renders them valueless. This condition is often masked by the addition of substances by the dispenser in order to disguise odor. Ointments are employed in surgery to meet one or more of the following indications:—

1. As unirritating and protective dressings to wounds and granulating surfaces.
2. As stimulating and protective dressings to chronic and indolent ulcers.
3. As means of impressing the glandular system with resolvent agents.
4. As means of affecting certain portions of the system with alterative or constitutional remedies.
5. To induce counter-irritation.
6. To secure astringent and sedative effects on mucous surfaces.

The results obtained from the use of ointments depend largely upon the manner in which they are employed. If used as a protective dressing to wounds or granulating surfaces an ointment is best applied by being evenly spread on the smooth side of patent lint or Canton flannel, from one-twelfth to one-sixteenth of an inch in thickness. When a surface is to be covered the cloth on which the mass is spread should be so fashioned as to cover only the selected spot. If the covered surface be of large size, a few fenestræ should be made so as to permit the escape of discharges. On each reapplication of the ointment the skin should be thoroughly cleansed with turpentine, soap and water, and alcohol. If such a course be pursued, the activity of the agents will be maintained and their absorbing powers increased.

The absorption of an ointment by the skin, especially over a large area, can be greatly facilitated by covering the selected surface with a properly prepared flaxseed poultice. In peritonitis the absorption of mercurial ointment by this method has been sufficient to affect the gums in twenty-four hours.

When the absorption of the ointment is to be accomplished by friction or inunction, the character of the base is important; it should readily soften with the temperature of the body and should not become tenacious or gummy with friction. This is one of the objections urged against lanolin when employed in its pure state. This difficulty can be successfully met by the addition of a small portion of olive oil. Since the flexor surfaces of the limbs are rich in absorbents this region is preferable for the employment of such a method.

The inunction should not be applied twice in succession to the same surface, which should be permitted to be free from the unguent for twenty-four hours after the skin has been thoroughly cleansed. Irritation of the skin or hair follicles frequently follows.

Ointments are frequently applied to the mucous surfaces of the genito-urinary tract and the rectum. To apply an unguent to the male urethra requires some mechanical contrivance, of which many are to be found in the shops. A simple method of applying an ointment (see *Zinci oxidum*), is by means of a properly prepared olive-pointed bougie, or by having the ointment dispensed in a collapsible tube, such as are employed by artists for holding colors. On the end of such a tube a piece of rubber tubing of small calibre is placed which is gently inserted into the urethra. By firm and gentle pressure the ointment is thus forced far back in the canal with little difficulty. When it is desired to apply an unguent to the rectum and the anal margin, it may be done best by anointing the finger and gently inserting it through the sphincter. If it is desired to impress the surfaces higher up, a suppository of cocoa-butter will be found more convenient.

Plasters (emplastra) are employed (1) as a means of support after the approximation of broken or cut surfaces, and for the retention of dressings; (2) to produce counter-irritation, (3) for the exhibition and administration of remedies.

Most plasters contain litharge and olive oil, or resinous substances, which at ordinary temperatures are firm and non-adhesive (soap plaster is soft at ordinary temperature), but which when exposed to a higher temperature than the body soften and become adhesive, and when placed in contact with the skin adhere firmly. In heating plasters, either for the purpose of spreading or for application, the temperature should never be raised beyond 212° F., or decomposition may be produced and volatile substances upon which the virtues of the preparation depend may be driven off. Plasters are usually spread on leather, sheep skin, chamois, or muslin, according to the purpose for which they are intended. A plaster spread on leather is ordered when it is to be applied to unbroken skin, and when the relief of pressure, or the necessity of support is indicated. A plaster spread on muslin is used as a dressing on an abraded or ulcerated surface, or as a protectant on the approximated edges of a wound. Plasters spread on muslin and incorporated with India-rubber to insure adhesive properties have of late been introduced. When well made these are efficient, but, unfortunately, many such plasters for sale in the shops are worthless. On the whole, it is best to rely upon plasters made after the directions of the U. S. P. Plasters are sometimes perforated with small holes to allow portions of the skin to be exposed to the air. In selecting plasters for surgical dressings, as in fixation apparatus for chronic diseases of the hip joint in children, it is often advisable to perforate the plasters used in making extension before applying them to the skin, especially when they are to be kept long in position. It must be remembered in the employment of plasters containing substances of the class of belladonna, opium, etc., that toxic impression has ensued in persons having delicate skins, or in subjects exhibiting idiosyncrasies to the effects of the drugs employed.

Douches and injections are applied in surgery to the mucous surfaces of the rectum and genito-urinary tract for their sedative, astringent, detergent, and antiseptic effects. It must be borne in mind that the sensibility of the mucous surfaces vary according to the part affected ; thus, solutions that can be readily borne by the vagina will prove unbearable to the bladder or urethra. To secure the best results, explicit directions must be given in ordering any special line of treatment, which, in nearly all cases, is carried out by the patient. Most of the unsatisfactory results obtained are attributable to ignorance or inability to carry out the directions given. The male genito-urinary tract is frequently the seat of specific inflammation, to which an immense amount of indiscriminate and misjudged medication is applied. Before ordering an injection or douche, the point of disease should be localized, and all attempts concentrated as much as possible upon the affected part.

Injections should be administered immediately after urinating, which in itself tends to cleanse and flush the mucous surfaces; so that when a medicated solution is thrown into the canal its full effect can be produced on the lining membrane. The patient should be in the sitting posture, well forward on the edge of a chair. The penis should be held between the thumb and fingers of the left hand, the former directly above the meatus. By gentle pressure the meatus is opened, the nozzle of the syringe is introduced, and its contents are thrown into the urethra. Upon its removal the meatus is closed with the fingers. While in this position, gentle stroking pressure is made over the under surface of the penis with the right hand, which will insure the solution's coming in contact with all portions of the canal.

With some persons care must be exercised that the fluid which may carry before it septic materials, or in itself be a source of irritation, is not thrown into the bladder. To obviate such an accident the patient should sit on a folded towel or compress, which will cut off the deep urethra.

When it is desired to impress certain portions of the urethra with strong solutions, they are best conveyed by specially prepared instruments with long nozzles, or through a speculum.

All medicated solutions should be diluted, their strength being gradually increased by reducing the amount of water according to the sensations of the patient.

In douches and injections we possess convenient means of making topical applications to the bladder. Many instruments have been devised, known as two-way catheters, which will insure the passage of a continuous current. Theoretically these would appear to fill all indications. We have found that satisfactory results can be obtained by the use of a soft English catheter, which is the least irritating, and consequently the best for the patient. A rubber bottle, holding about four ounces, and fitted with nozzle and stop-cock, or a tight-working hard rubber syringe, the nozzle of either of which is easily introduced into the catheter, is used, and the desired amount of fluid is gently and slowly thrown into the bladder (two or three ounces probably sufficing), and allowed to remain there for a short time. This process may be repeated two or three times, until the return fluid indicates that the object intended has been attained. Care must be exercised that air does not find admission into the fluid, as its presence tends to decompose the urine, especially if bloody. (For vaginal douching or injecting see *Aqua*, p. 95.) Douches or injections are employed in the rectum for a great variety of purposes, as for the removal of impacted fæces or ascarides, or to convey medicated or nutritive substances. If it is desired that fluid should extend far up the bowel, the patient should be in a recumbent posture on the left side, with the hips slightly elevated. The fluid is preferably thrown from a fountain syringe held at a slight elevation above the pelvis. This will insure a slow but steady current, allowing the mucous surfaces to become gradually accustomed to it, whereas, if rapidly thrown in, the fluid will soon be rejected.

General Remarks on Local Treatment of Diseases of the Skin.—External applications to the skin are intended either to remove debris or effete matters, and so to allow of the direct application of remedies to the diseased parts, or they are employed with a curative intent.

Among the first class are baths, wet compresses, poultices, etc.

Those applications, which are intended to act directly upon the diseased parts, are *sedative*, *astringent*, *stimulant*, *alterative*, *caustic*, and *parasiticide*.

Sedative applications are usually applied in the form of lotions, baths, or powders. Some few ointments are directly sedative in their effect. In acute inflammatory conditions lotions are usually acceptable. These may be evaporating, or may be applied in such a manner as to afford heat and moisture as well as a soothing influence. Where there is much fluid exudation powders are sometimes employed to check this, but their siccative effect is sometimes disagreeable, and they should then be followed by a mild inert unguent.

Ointments made with lard are rarely to be employed as sedatives in acute inflammatory conditions of the skin, because they become decomposed very easily and develop the fatty acids, which are highly irritating. Petrolatum should usually form the base of sedative ointments.

Astringent remedies used in the treatment of diseases of the skin, like the sedative remedies, are ordinarily employed in the form of powders and lotions. Few remedies employed in the form of ointment exercise any decided astringent effect upon the skin. Perhaps an exception may be made in favor of those containing tannic acid.

Stimulant remedies are ordinarily employed in the form of ointments. The vigor and thoroughness of their application is an important element in their successful use.

Caustic applications are employed in both the solid and liquid form. Their effect ranges from the most superficial removal of the epidermis to a distinctive effect upon all tissues with which they come in contact. The choice of a caustic in any given case must be made with due deliberation, for, when applied wrongly, mischief may be wrought which is irremediable.

The severer caustics should never be used in the neighborhood of the larger blood-vessels or of important structures, and no caustic of high destructive power should be used upon a mucous membrane unless this can be previously made dry and the part to be operated upon can be thoroughly isolated.

Parasiticide remedies are divided into two classes—those intended to destroy animal parasites and those intended to destroy vegetable parasites. These remedies are easily applied and have only a limited range. They should never be of such a character as to injure the skin.

The remedies intended to cure the vegetable parasitic diseases of the skin are almost always of such a character as to cause desquamation of the epidermis. Indeed, it is asserted, upon high authority, that we have, strictly speaking, no true parasiticides applicable to the vegetable parasites growing upon the skin, but that all the so-called parasiticides act simply by causing an exfoliation of the epidermis, which carries the parasite bodily away with it.

However this may be, the manner of application of the parasiticidal remedies is more important than their choice. Unless thoroughly brought into contact with the offending organism, but little effect can be expected.

In connection with the general subject of the topical application of remedies to the skin, *medicated soaps* (see p. 397) may be mentioned. These should have a well-made and non-irritating base, to which the medicament may be added. Soaps form a very imperfect vehicle by which to convey drugs to the deeper layer of the skin, but they may be used to advantage as a preliminary to other treatment.

Baths are employed both to remove the products of disease, as scales, crusts, etc., and to act directly upon the skin.

Simple baths of warm water soften the epidermis and allow the removal of waste material and of the products of exudation. Baths are also used as a vehicle to facilitate the introduction of medicinal agents. The application of warm water also has a sedative effect upon the skin. (See *Baths*, pp. 98, 456.)

General Remarks on Local Treatment of Diseases of the Respiratory Tract.—While the *lotion* implies a lavement for medicinal purposes to a portion of the skin or mucous membrane, the *gargle* is restricted to the method of self-use of a lotion to make direct application to the pharynx. Lotions are used as gargles or by the syringe and douche.

In order to *gargle* the pharynx with effect, the fluid is carried into the throat as in the act of swallowing. The first and second parts of this act are completed, but as the fluid is about to pass from the pharynx to the œsophagus it is regurgitated (the inclination of the head forward facilitating) and the fluid is ejected from the mouth and nasal chambers.

The value of the gargle depends upon the force exerted by the muscles of the pharynx. When this is impaired either by not being called into play, as in the instinctive avoidance of pain, in inflammation and cancer, or in paresis, as in the sequelæ of diphtheria, gargling is an unreliable means of treatment. In the young and the aged its significance is almost nil. Old people with stiff necks (all persons with torticollis) do not like to gargle. Gargling, when well performed, is efficient in distributing the lotion throughout the recesses of the side spaces of the pharynx in a manner more thorough than is possible in any other way. The fact must be conceded, however, that the practitioner is never sure of such a result being secured. Many patients frankly acknowledge their inability to clean the throat by this means. M. Mackenzie denies that the gargle is of any use in disease which exists behind the mouth. Since sprays have been so generally introduced the gargle is less used than formerly. Bremen (*Monats. für Ohrenheilk.*, No. 4, 1887) claims that the fluid can be thrown directly into the bronchi. It is to be conceded that sprays, since they are independent of the volition of the patient, possess advantage over the gargle. Yet they are apt to excite distress if they are used under a high degree of compression, do not reach the recesses at the side of the pharynx and are liable to variations in intensity and size of atoms (drops); and the spray apparatus is so apt to get out of order that directions are often futile. Two kinds of sprays are named, the coarse and the fine. The coarse spray is preferable in the treatment of nasal, naso-pharyngeal, and oro-pharyngeal conditions, since the force by which the fluid is driven dislodges tenacious secretions. But in the treatment of the larynx and lungs the coarse spray is not so satisfactory, as it is too heavy to be influenced by the current of inspired air and readily condenses upon the walls of the pharynx and soft palate. The number of times each spray inhalation should be used in the throat varies according to circumstances. If intended to promote suppuration by means of moist heat the application of sprays should be kept up continuously if practicable—at least should be used as often as can be done with comfort. For CHRONIC LARYNGITIS it should be used three or four times a day and about five minutes each time. M. Mackenzie considers that the best times for using steam inhalations are night and morning, allowing five minutes for each exposure. Six inspirations should be taken in a minute.

An inhalant is a remedy which is diffused in the air and is *drawn* in the nose, mouth, and throat by the act of breathing. It is thus opposed to the spray, in which the remedy is *thrown* in.

It may be accepted tentatively that no form of the vapor of water can be relied upon to carry medicinal agents in the respiratory passage further than the larger divisions of the bronchial tubes.

It is far different with volatile substances. The vapor of ether and chloroform and of the numerous volatile oils—presumably reaches the alveoli of the lungs and is absorbed by the pulmonic vessels. Many of the volatile oils yield stimulating inhalants, which are conveniently combined with steam. These are indicated in chronic inflammation, accompanied with hyper-secretion. In the judgment of many practitioners stimulating inhalations are of doubtful worth, since the agents cannot be used in strength sufficient to relieve the symptoms without exciting spasm of the glottis or other irritative effect. This is less true than formerly, owing to the increase of the number of agents from which selections can be made, while for the sedative and antispasmodic inhalants, whether used in the medium of steam or otherwise, no doubt remains of their value in many conditions of disease. Nevertheless, inhalations must be used with discrimination to insure safety and success.

Steam is the favorite inhalant. It is a convenient means of diffusing moist heat. Like other forms of water, it tends to dilute mucus and thus diminish its irritative power. It removes the sense of dryness so common in acute affections of the throat. In TONSILLITIS it favors the formation of pus, and is thus indicated when it is desired to hasten suppuration. Its use is contraindicated in PHARYNGITIS when there exist relaxed states of the glands and membranes, with hypersecretion. It will be observed that the uses and abuses of steam are much the same as those of moist heat in other forms than steam. It can be variously medicated by the use of apparatus known under the name of steam sprayers.

Steam should be *inhaled, i. e.,* should not be *forced* in the nose and throat. By reason of this, steam, the vapor arising from the surface of water (ordinarily at the temperature of 145° F.), is often borne when sprays excite irritation. In many individuals with irritable mucous membranes, when an attempt is made to spray the throat the tongue instinctively ascends at its basal half and occludes the passage of air. To properly use the spray in such cases the mouth should be wide open and the tongue depressed. If difficulty is experienced the nostrils must be closed. If the trachea and bronchi are to be reached the inspirations must be deep.

The term *fumigation* is employed for sublimated vapors from mineral substances as well as for nascent *fumes* arising from the destruction by ignition of organic substances.

Fumes of medicated cigarettes can be drawn into the middle ear by the Valsalva method. (McNaughton Jones.)

Mercurial fumigation has been perfected by the late Mr. Langston Parker, of Birmingham, and is spoken of highly by Lee, Duncan and others. It acts in three different directions: 1. by the introduction of mercury into the system; 2. by diaphoresis; 3. by the topical effect of the remedy.

Troches (Trochisci: Lozenges) are official (U. S. P.). The directions which are usually given for their manufacture is to mix the medicinal agent with a small proportion of powdered tragacanth and a large proportion of powdered sugar, and then to make a mass by rubbing the resulting powder with liquid (either water or syrup) until a mass is obtained. This is cut with suitable hand dies or by machinery into troches usually weighing from ten to fifteen grains. Mackenzie used black currant paste in place of sugar as the vehicle for the medicaments. Black currant paste is made by expressing the juice from black currants and mixing it with sugar. It is a delightful vehicle for such purpose. Troches are now made almost universally in a different way from that directed by the Pharmacopœia; dry powders are mixed and then subjected to compression (*tablets*) in elaborate machines built for the purpose. The term tablet is also given to a compressed powder from which a lotion is made.

Troches act locally upon the walls of the mouth, pharynx, and œsophagus.

Pastilles (gelatin discs) are lozenges composed of gelatine and glycerin. They are variously medicated. W. M. Whistler (*Med. Times and Gazette*, 1878) states that pastilles are especially suited to cases of inflammation of the tongue or palate; the mucilaginous nature gives much relief in dryness of the throat; the soft consistence renders them particularly useful in cases of œsophageal disease. (See articles "Gelatin" and "Glycerin.")

Powders.—Powders to be efficient as protectants must be moderately hygroscopic, such as starch and sugar, boric acid, etc., and the bulk of the mass employed must bear a fixed relation to this quality. Many powders, such as talc and lycopodium, take up moisture by imbibition without themselves undergoing change. Powders must not be used too fine, else the particles mat and form hard masses, beneath which concealed accumulations of discharges occur. On the upright walls of the nose, pharynx, and trachea very fine powder is less apt to retain position than one that is used in a coarser form.

Powders are indicated in acute inflammation of the pharynx, since their disposition is to diffuse by muscular action and motion of the adjacent parts. They afford a safe means of applying substances of caustic strength in the pharynx and larynx. Salts of copper, lead, zinc, and mercury should be used with great caution in form of powder, since it is impossible to know how much of the agent may be swallowed; on the other hand, topical applications may be employed with a view to securing not only a topical but a general effect; this is especially the case in the treatment of syphilitic affections. In diphtheria the effect of calomel applied on the exudate is measured by the character of the stools.

Insufflations into the trachea can be best made by advising the patient to take deep inspirations at the time the powder is thrown in. If the instrument is pushed into the glottis it is, of course, possible to have the powder pass into the trachea. (Schaffer.)

M. Mackenzie especially commends the use of powders in tracheal affections. They are less apt to excite spasm than are liquids. A mass the size of a bean may be thrown at a sitting.

That powders introduced into the nose can be inhaled is apparent when the results of inhalation of coal dust in miners, particles of steel in knife-sharpeners, etc., is remembered. According to Beltz (*Archiv für Kinderheilk., Bd.* x, Heft 5), WHOOPING COUGH can best be treated by insufflation of powders into the nasal chambers.

General Remarks on the Local Treatment of Diseases of the Eye.—Topical applications to the eye are detergent, soothing, astringent, stimulating, caustic, antiseptic, mydriatic, or myotic ; and are made by means of solutions, ointments, oils, or powders.

Solutions used in eye practice are known as *collyria.* The term "collyria" was used by Hippocrates and Galen to designate solid medicaments of a cylindrical form, intended for introduction into the vagina, anus, ears, and nose—a kind of suppository or bougie. Later it was applied to all kinds of topical applications made to the conjunctiva, whether fluid, solid, or in powder, but is now limited to solutions dropped into the eye, and is practically synonymous with the popular expression, "eye drops." Collyria are ordinarily applied by means of the pipette with small rubber bulb, but, if this is not at hand, a simple glass tube or quill will answer the purpose nearly as well. While the patient's head is thrown backward, the lower lid is gently drawn down and the solution dropped into the lower cul-de-sac of the conjunctiva. It should be remembered that the strength of the application cannot be regulated by the amount of fluid used, as not more than one or two drops will be retained in the conjunctival sac. Usually an excess does no harm, but when the mydriatics are used not more than two or three drops at most should be applied. As an additional precaution against the constitutional effects of the drug, it has been recommended to press the end of the finger over the lachrymal canals for a few minutes, to prevent the passage of the fluid into the nose and throat. When it is desired to act upon the lachrymal passages, they should first be emptied by pressure upon the sac, and the solution should then be applied freely to the inner canthus.

When it is desired to flush the conjunctival sac for cleansing and antiseptic purposes, as before, during, and after an operation, and in purulent cases, a larger tube with an ounce rubber bulb is a very convenient instrument. The sponge is not now much used. The old "eye cup," whose edges fit within the margins of the orbit, is an easy and pleasant means of making free applications of soothing washes. The eye douche, for directing a spray against the closed lids, may be made by attaching a nozzle, perforated with small holes, to a rubber tube connected with a cup, or the "fountain syringe," to be held above the head; but it is now generally superseded by the atomizer.

Oils are applied with the pipette, or by means of a pledget of absorbent cotton. Ointments, when intended for the margins of the lids only, should be used in very small quantity, to avoid irritating the conjunctiva. A little is taken on the end of the forefinger and the edges of the lids are simply anointed, so that there shall be a delicate film of the ointment between them when they are closed. When it is intended to act upon the cornea, a piece of the ointment the size of a pin's head may be placed directly upon it, or be applied to the conjunctival surface of the upper lid.

Powders were formerly "insufflated," or blown from a glass tube or a quill upon the eyeball, but are now always "dusted" from a camel's-hair brush. The handle of the brush is held between the forefinger and thumb, while the brush is struck sharply with the little finger of the same hand.

Drugs may also be applied to the eye in the form of soluble solids. Medicated *gelatin discs* for this purpose have long been made by Savory and Moore, of London, and were occasionally used in Philadelphia some fifteen or twenty years ago, but of late years seem to have been entirely abandoned. They contained atropine, eserine, and pilocarpine. Attention has recently been called to the subject by C. A. Wood, of Chicago, and, under his direction, the Messrs. Wyeth, of Philadelphia, after careful and prolonged experimentation, have prepared a series of compressed and gelatinized discs containing all the substances ordinarily used in external applications to the eye. The list includes eighty discs medicated with various drugs, either singly in different proportions, or in combination. To modify the disturbing effect of cocaine upon the corneal epithelium, the discs containing that substance are made of gelatin; all the others are made by compression, and are formed of dried flaxseed mucilage combined with boric acid.

The chief advantage claimed for these discs is that, by means of their slow solution, the drug is maintained continuously in contact with the conjunctiva, instead of being, in great part, carried off by the overflow of tears, as is the case with aqueous solutions. This consideration is especially important in the case of mydriatics; and, further, in the case of an expensive drug, like homatropine, or of one likely to cause troublesome constitutional disturbance, like duboisine, it is evidently desirable to use the least possible quantity that will ensure the desired effect. Perhaps the most useful of the discs is that medicated with homatropine and cocaine. It contains one-fiftieth grain of each drug: the same quantity that is held by one minim of a twenty per cent. solution. It promises to be very convenient in refractive work. A second disc may be added, if it is thought necessary, after the first has dissolved. Wood recommends the introduction of an eserine disc (gr. $\frac{1}{100}$) after completing the examination.

For the application of astringents, stimulants, and antiseptics to the conjunctiva, most surgeons will probably prefer to use aqueous solutions.

The discs are easily applied by taking one on the point of a moistened camel's-hair brush and placing it against the conjunctiva of the ball. The eye should be closed while absorption is going on.

LIST OF ABBREVIATIONS.

U. S. P.—United States Pharmacopœia.
U. S. D.—United States Dispensatory.
Br. Ph.—British Pharmacopœia.
M. B.—Merck's Bulletin.
M. Mackenzie, refers to " Diseases of the Throat and Nose," 1880. Am. Ed.
Lefferts, refers to " A Pharmacopœia for the Treatment of the Diseases of the Larynx, Pharynx, and Nasal Passages," New York, 1888.

LOCAL THERAPEUTICS.

ACACIA. Gum Arabic.

A gummy exudation from various species of Acacia. Gum Arabic is slowly soluble in its weight of cold water. Solutions of gum arabic to be elegant should always be made with *cold* water, as the use of hot water results in a dark-colored solution. The best form of the gum for solution is the granular powder to be obtained in the shops. Gum arabic is precipitated from its solutions by alcohol, by subacetate of lead, solution of ferric chloride, and concentrated solution of borate of sodium. It is insoluble in alcohol, in ether, and in oils.

Diseases of the Ear, Nose, and Throat.—Powdered acacia, when used in a pure form, acts as a protectant. It slowly dissolves in the mucus, which it increases in density; in this manner it serves to diminish excitement when from any cause the mucus assumes a serum-like character. The powder acts mechanically as a vehicle in the distribution of an insoluble drug, such as subnitrate of bismuth; it aids also in retaining drugs for a longer time than would otherwise be the case upon the moist membranes of the nose and throat. Gum acacia forms the basis of many pastilles, and even when not medicated, as is the case with the "gum drop" of the confectioner, it allays Cough when this symptom is due to the retention of mucus on the posterior laryngeal region or the vocal cords. The syrup is often added to cough mixtures to effect a similar object. *Jackson's cough mixture*, which is composed of the diluted syrup of acacia to which a small proportion of morphia is added, acts, for the most part, through the local impression made on the tissues.

Pulverized acacia is an ingredient of *Ferrier's snuff* in the proportion of two drachms of acacia, six drachms of the subnitrate of bismuth, and two grains of sulphate of morphine.

ACIDUM CHLORACETICUM. Chloracetic Acid.

Three forms are known:—

Mono chloracetic acid, ... $C_2H_3ClO_2$
Di chloracetic acid, ... $C_2H_2Cl_2O_2$
Tri chloracetic acid, ... $C_2HCl_3O_2$

The various chloracetic acids are, as can be seen, glacial acetic acid ($HC_2H_3O_2$), in which respectively one, two, and three atoms of hydrogen are replaced by chlorine.

The mono and tri acids are crystalline solids; the di acid is liquid. They all form salts soluble in water.

CHLORACETIC ACID.

Diseases of the Skin.—*Monochloracetic acid* forms an admirable caustic in the treatment of superficial EPITHELIOMATA. It seems to have a selective affinity for the diseased tissues, and its action can be strictly limited. It may be applied with a bit of stick or on a probe armed with cotton. Its action is not deep and it must therefore be applied at frequent intervals. It is less suitable than the stronger caustics, particularly caustic potassa, for large and deep growths, but is safer when the disease is close to some important organ, as the eye, when the action of the caustic must needs be circumscribed. Monochloracetic acid likewise forms an excellent caustic for VERRUCA and CONDYLOMATA and for small NÆVI.

Diseases of the Ear.—Applied freely to AURAL POLYPI, chloracetic acid constitutes, on the whole, the best means for their destruction. According to W. B. Dalby, "if the pain after using the caustic is severe, it subsides immediately after using a syringe full of water. Eight or ten applications may be required; these may be made every day for a time and then less frequently." Dalby insists that treatment should be conducted for long periods, and also that assiduous care should be exercised in cleansing the middle ear, no matter what agent is used to destroy the growths.

Diseases of the Eye.—Monochloracetic acid is a valuable caustic in the treatment of EPITHELIOMATOUS ULCERS of the eyelids in cases in which excision is, for any reason, impracticable. It should be used in saturated solution (deliquesced crystals), and may be applied, by means of a pledget of absorbent cotton on the end of a small probe, to the whole surface of a small ulceration or about the margin of a more extensive one. It produces little reaction, and the application is usually almost painless. Repeated applications may be necessary but are easily borne. In several discouraging cases, cicatrization has been produced which has remained quite firm for many months.

TRICHLORACETIC ACID.

Trichloracetic acid was introduced into medicine by Stein (*Wiener Med. Blätter*, March 20, 1890).

It is used as a caustic and stimulant.

Diseases of the Skin.—Lanz (*Monatsch. f. P. Derm.*, Oct. 1, 1891) states that trichloracetic acid is one of the best applications for VERRUCA, especially in infants and young children. It causes little or no pain, and the wart often dries up and drops off after a single application. NÆVI, both VASCULAR and PIGMENTARY, may be removed by trichloracetic acid, a very superficial and scarcely noticeable scar remaining. ATONIC ULCERS, particularly of a venereal character, are much improved by the application of trichloracetic acid as a stimulant.

Diseases of the Nose.—Ehrman (*Wiener Med. Blätter*, March 20, 1890) applies a moist crystal to INTRA-NASAL HYPERTROPHIES by means of a silver probe, which is then rubbed over the part which it is desired to cauterize. The tissues are whitened by the acid; the eschar separates within a week's time. The agent is of the same character of causticity as chromic acid, but according to this writer is more manageable. O. F. Brown (*Amer. Rhinological Assn.*, 1886) has also invited attention to this caustic. J. W. Gleitsman (*Med. Record*, 1891, 312) speaks highly of it. He prefers an aluminium rod, which is so fashioned that a cup-shaped depression exists at the free end, to any other form of applicator. The excavation is filled with the crystals. The pain arising from the use of the acid is insignificant, and can be readily controlled by a ten per cent. solution of cocaine. The caustic is remarkable for the dryness and compactness of the eschar, which is thrown off at a period varying from two to seven days. The agent has been used successfully in all forms of nasal and pharyngeal hypertrophy, as well as in aural polypi.

ACIDUM ACETICUM. Acetic Acid.

The acetic acid of the U. S. Ph. is really a solution of acetic acid in water, containing 36 per cent. of absolute acetic acid. The acetic acid of the Ph. Br. is also a solution in water, containing 33 per cent. of absolute acetic acid.

In the Ph. Br., malt vinegar (acetum) is official, and contains from four to five per cent. of absolute acetic acid. Vinegar is not official in the U. S. Ph., but in its stead is "diluted acetic acid," containing six per cent. of absolute acetic acid.

Acetic acid is six times as strong as is diluted acetic acid. Acetic acid was formerly commonly called "No. 8 Acetic Acid," because, until a late revision of the U. S. Ph., diluted acetic acid was made by diluting one measure of acetic acid by seven measures of water, and the result was a liquid about equal in acetic acid strength to vinegar. According to Squibb the No. 8 acetic acid is "commonly sold, whether demanded or not, both in the arts and for medicinal and dietetic purposes." He found it to vary from 22 to 32 per cent. in strength. There is also official, glacial acetic acid, which is "nearly or quite absolute acetic acid." The formula for glacial acetic acid is $HC_2H_3O_2$.

Pyroligneous acid of the U. S. Ph. is crude acetic acid, and contains, in addition to a proportion of absolute acetic acid, creosote and empyreumatic oils.

Vinegar enters into composition of *St. John Long's Liniment.*

ACIDUM ACETICUM DILUTUM. Diluted Acetic Acid.

Diluted acetic acid is disinfectant, hæmostatic, solvent, and mildly excitant. The effect upon the mucous membranes of the throat and nose is to increase the determination of blood to the parts, and to insure activity of the secretions (Rossbach).

General Surgery.—Acetic acid, properly diluted, is a useful injection in some cases of CHRONIC CYSTITIS. The strength should be eight or ten minims to the fluidounce of water. Thompson recommends, as most useful after the use of nitrate of silver: ℞. Plumbi acetat., ℈ij; Acid. acetic. dil., ʒvj; Acid. carbolic., ʒss; Aq. dest., ℥iv. One drachm of this mixture is to be added to four ounces of water and injected once or twice a day.

Engelmann (*Medical Record*, November 24, 1888) has used acetic acid in a three to five per cent. solution, AS A DISINFECTANT IN OBSTETRICAL PRACTICE in preference to carbolic acid or corrosive sublimate, regarding it as more diffusible than the latter and less injurious to instruments, and equally with it as free from danger to the patient. The skin of the hand is rendered particularly soft and pliable.

T. H. Harvey has prepared *an acetized cotton* of five, twelve-and-a-half, and twenty per cent. strength, to be used as a hæmostatic in place of the usually prepared styptic cotton. This cotton should be kept moist in air-tight bottles.

Diseases of the Skin.—Acetic acid is employed in the treatment of skin diseases in three forms: *Glacial Acetic Acid*, *Diluted Acetic Acid* (U. S. P.), and *Vinegar.*

Acetic acid of the U. S. P. is employed in the treatment of several diseases of the skin. In PSORIASIS it is valuable in removing the scales and in preparing the ground for future treatment. In CONDYLOMATA it has been used by hypodermic injection, but no data have been published, so far as we know, to establish its value in the cure of these growths. Unna uses the following prescription for CONDYLOMA of the external genitals:—℞. Acidi salicylici, ʒss; Acidi acetici, f℥j.

This mixture is to be applied twice daily by means of a small brush or a tuft of cotton on an applicator. The pain it causes is slight, and Unna prefers it to any other treatment.

Diluted acetic acid, in the form of distilled vinegar, goes to make up a wash highly recommended in ALOPECIA PRÆMATURA. What part the drug plays cannot be explained, unless it be to act as a solvent to the pityriasic exfoliation which commonly accompanies this affection. One formula, the long and successful use of which has established its value, is the following: ℞. Tinct. cantharidis, fʒvj; Tinct. nucis. vomic., f℥ss; Aceti destillat., f℥iss; Glycerini, fʒij; Aquæ, ad f℥vj.

In the form of vinegar, the diluted acetic acid has been very highly recommended in DERMATITIS from sunburn. Another employment of vinegar, or diluted acetic acid, which we have found valuable, is in the destruction of nits in PEDICULOSIS of the scalp and pubis. After the living animals have been destroyed, the nits or ova remaining cling to the hairs, and if not destroyed will hatch out in a few days. Diluted acetic acid destroys them.

Diseases of Ear, Nose, and Throat.—Diluted acetic acid in the form of vinegar is a popular vehicle for exhibiting many remedies designed to affect the throat locally. M. Mackenzie uses a gargle composed of 30 minims of the diluted acid to 18 minims of glycerin in an ounce of water. In the last stage of the Anginæ of Exanthemata this mixture is especially indicated. It has even had its advocate in Phlegmonous Inflammation of the throat; but many more valued agents are here available. F. Engelmann (*Centralblatt für Klin. Med.*, 1886, No. 14) recommends acetic acid in the local treatment of Diphtheria. In the list of medicines for our selection, many must take the preference to one which is so diffuse in its effects and whose odor is so penetrating. The diluted acid has been injected successfully into the Tonsil to reduce Hypertrophy. Equal parts of vinegar and water placed on a stove charges the sick-room with a vapor which is grateful in Acute Coryza.

S. J. Bumstead speaks highly of diluted acetic acid in controlling the Cough of Laryngitis and as a solvent in the treatment of Croup and Diphtheria. For the first named he uses the old domestic form of diluting vinegar with molasses or honey and employing it as a gargle. For the diseases last named he prefers the form of steamed vapor, by heating vinegar in large trays or pans.

Vinegar is a valuable hæmostatic. It has been used with especial benefit in Epistaxis. The vinegar can be injected in the nostril, or tampons of lint or absorbent cotton saturated with the agent can be carried into the nasal passage. The diluted acetic acid, one part of the acid to five of water, will represent a strength suitable for use in absence of vinegar. Stronger vinegar also acts as an excellent counter-irritant when applied to the skin of the throat in Angina. Diluted vinegar may be drunk freely in Æsophagitis when due to an alkali.

Diseases of the Eye.—Largely diluted acetic acid is a pleasant and useful application in Acute Conjunctivitis. Ten drops of the acid in an ounce of distilled water may be combined with from two to four grains of acetate of morphine.

A frequent form of injury of the eye is by Lime in the Conjunctival Sac. If the patient is seen immediately after the accident, the eye should be thoroughly cleansed with diluted acetic acid, or vinegar, which is always at hand, in the proportion of ʒj to ℥j of water.

Acidum Aceticum Glaciale. Glacial Acetic Acid.

Glacial acetic acid should consist of over 99 per cent. of absolute acid ($HC_2H_3O_2$.) It should form a clear mixture with an equal volume of oil of lemon. Much of that in commerce will not respond to this test, as it is only from 70 to 80 per cent. in strength.

Glacial acetic acid is a powerful caustic. Applied to the skin it produces intense redness, followed by rapid vesication. The impression is painful. The acid must be used with caution, as its action extends to considerable depth and a severe sore may ensue. On horny growths it exercises a solvent action without the production of a distinct slough or eschar. It seems to soften, gelatinize, and dissolve the horny epithelium. On mucous surfaces it induces a white albuminate. Glacial acetic acid is also classed as a parasiticide.

Diseases of the Skin.—As a caustic, glacial acetic acid is sometimes employed in the treatment of WARTS and CORNS. A few drops applied twice daily, will, after a time, complete their destruction. Its action in this regard is somewhat milder than that of other caustics. On HORNY GROWTHS it exercises a solvent action without the production of a distinct slough or eschar. In small NÆVI the action of glacial acetic acid is often very satisfactory. It is best applied on the point of a sharpened stick, which is bored into the nævus patch at one or several points. The slight pain caused by the application passes away in a few moments. But little subsequent reaction is noticed. Piffard has found a mixture of equal parts of glacial acetic acid and glycerin of use in the smaller patches of LUPUS ERYTHEMATOSUS, where it seems to stimulate absorption of the morbid deposit. In TINEA UNGUIUM, glacial acetic acid is also employed for its parasiticide effect. The affected nail is scraped down as near to the quick as possible and then the acid is applied. This softens the horny tissue of the nail and penetrates to the fungus, which it appears to destroy. Glacial acetic acid has been recommended in the treatment of various NEW GROWTHS, but we are inclined to think its effect inferior to that of other caustics. Glacial acetic acid is employed in the treatment of TINEA TONSURANS, a drop of the acid being introduced into each of the individual hair follicles, when only a few of these remain affected in stubborn cases. Its action here is probably merely caustic, as it causes softening and exfoliation of the layers of epithelium which are infiltrated with fungus.

Diseases of Ear, Nose and Throat.—Glacial acetic acid is one of the most useful agents employed for reducing HYPERTROPHIES OF THE NASAL MUCOUS MEMBRANE. The indication for its selection is the presence of inflammatory products in the submucous tissue and proliferation of the epithelial layer. Such a condition commonly results from a neglected catarrh, or the prolongation of the subacute stage of an ACUTE CORYZA. It is contraindicated where the membranes are in a highly excited state from an acute inflammatory attack, or where the erectile element of the membrane is of marked degree. When the fibrous character of hypertrophies is well defined, acetic acid is less efficient than is chromic acid, or the electro-cautery. In making an application with the acid to secure a cautery-effect the parts should be cleansed and a drop of the glacial acid is carried on a dossil of cotton which is firmly wrapped upon a cotton carrier. The parts become instantly white from the coagulation of the albumin in the tissue. Pungent pain with lachrymation ensues which lasts for a few moments only. A second application should not be made until the first eschar falls off; the time for this varies, but is usually about three days. Owing to the diffusive character of acetic acid it is a difficult agent to manage in making application to the posterior ends of the turbinals. OTITIS MEDIA *has been known to ensue upon its too free employment.* Equal parts of glacial acetic acid and carbolic acid form the basis of inhalation in ACUTE CORYZA (M. A. Fritsche, *Berlin, Klin. Wochenschrift*, 1887, No. 27). The same writer employs the drug alone in the proportion of two parts of the acid to twelve of water. Glacial acetic acid in the strength of ten drops to an ounce of water can be used as an agent to immediately follow an application of caustic potash to prevent its over action.

The danger of the too free use of stronger forms of acetic acid in the throat may be illustrated by the following accident. A boy aged two years swallowed a mouthful of "vinegar essence," which was instantly followed by painful deglutition and vomiting on swallowing food. The pharynx, mouth, and larynx became swollen; the latter was covered with punctiform extravasations which were especially numerous on the epiglottis. The child recovered.

PYROLIGNEOUS ACID.

A dark brown liquid having a strong smoky smell. It consists essentially of acetic acid diluted with more or less water, and holding in solution chiefly tar and empyreumatic oil, with pyroxilic spirit and probably a small proportion of creasote. It is made by the destructive distillation of wood.

Diseases of the Skin.—Containing both acetic acid and creasote, pyroligneous acid possesses the properties of both these substances in the treatment of diseases of the skin. It has been employed successfully in the treatment of PRURITUS, particularly PRURITUS OF THE SCROTUM, being used in a diluted condition (1 to 30) at first and gradually strengthened. It is soluble in water and in glycerin, or may be used in ointment (Piffard, "*Mat. Med. and Ther. of the Skin,*" p. 10). Its use in PSORIASIS has been recommended (Jarisch, *Med. Jahrb.*, 1878, p. 511), but is not to be undertaken without caution, as absorption and poisoning may take place if used over too large a surface.

ACIDUM ARSENIOSUM.

When the names "arsenic" and "white arsenic" are used in medical treatises, acidum arseniosum is the product referred to. It is freely soluble in from 30 to 80 parts of water at 15° C. (59° F.) and in 15 parts of boiling water, in hydrochloric acid, the alkalies and their carbonates, but sparingly soluble in alcohol and glycerin.

Liquor acidi arseniosi (a one per cent. solution in two per cent. hydrochloric acid) and liquor potassii arsenitis (a one per cent. solution of arsenious acid combined with potassium) are official.

Diseases of the Skin.—Arsenious acid is employed locally on the skin as an escharotic. Dupuytren recommended a powder of 1 part arsenious acid and 24 parts calomel in EPITHELIOMA and FOUL ULCERS.

Arsenious Acid is employed as an escharotic in CANCERS. ℞. Arsenici sulphid, pts. lxx; Sanguinis draconis, pts. xx; Acidi arseniosi, pts. viij. This is made into a paste with water. Its application is painful and not without danger.

Arsenic is the chief ingredient in many secret remedies for the same affection. It is usually combined with some substance intended to dissolve the horny epidermis, as it will scarcely, if at all, act through this.

The famous *Poudre caustique de Frère Côsme ou du Rousselot* is: ℞. Acidi arseniosi gr. x; Hydrarg. sulphid. nig., ℈ ij; Pulv. carbo. animalis, gr. x. M. This powder is mixed with mucilage at the time of using.

The external part of "*Feburès remedy*" for CANCER consists of ten grains of arsenious acid dissolved in a pint of distilled water, to which is added an ounce of extract of conium, three fluid ounces of solution of sub-acetate of lead, and a fluid drachm of tincture of opium. With this the cancer is washed every morning. (U. S. Disp.)

"*Jusetmond's arsenical powder*" is: ℞. Antimonii sulphuret, pts. xvj; Acidi arseniosi, pt. j. M. Melt in a crucible. When cold reduce the mass to powder and add five parts extract of opium.

"*Manec's paste*" is composed as follows: ℞. Acidi arseniosi, gr. xv; Hydrarg. sulphid. nig., gr. lxxv; Spongia usta, gr. xxxv. This is made into a thick paste with a few drops of water.

Billroth (*Grundriss der Chirurgie*, V. 1, p. 303) in MULTIPLE SARCOMATOUS DEGENERATION of the lymphatic glands has used parenchymatous injections of five minims Fowler's Solution ($= \frac{1}{20}$ gr. arsenious acid) diluted with ten minums of distilled water combined with the internal use of the remedy with success, and the same treatment has been found useful in SARCOMA OF THE SKIN.

ACIDUM BORICUM. Boric Acid. Boracic Acid. Homberg's Sedative Salt.

Boric acid is made by decomposing solutions of borax (biborate of soda) with strong hydrochloric acid, and purifying. It is "soluble in 25 parts of water, and in 15 parts of alcohol at 15° C. (59° F.), in three parts of boiling water, and in five parts of boiling alcohol." (U. S. P.) It is also soluble in volatile oils, but is insoluble in ether. Hot glycerin dissolves boric acid freely, forming the substance known as boroglycerinum. See Article "Boroglycerinum."

Boric acid is sometimes contaminated with free hydrochloric acid and with chloride of sodium. These result from the imperfect carrying out of its process of manufacture, and both can be removed by washing it with cold water.

A borated cotton is prepared by steeping absorbent cotton in solutions of the acid, varying in strength from 15 to 45 per cent.

Boric acid, according to Dr. Sternberg, is inefficient as a germ-destroyer, but has considerable antiseptic properties. It is also a protectant, exsiccant and detergent.

General Surgery.—Boric acid was introduced as an agent in antiseptic surgery by Sir Joseph Lister, in 1872. It is used in dry powder in concentrated solutions and ointments, and in borated lint and borated cotton. Unlike most antiseptic agents, boric acid is bland and unirritating, and will allow the natural process of healing to go on without interruption. It can be readily used in any of the preparations mentioned above. We have used the dry powder by dusting over the part when a tendency to excoriation existed, such as is often seen after surgical dressings where two cutaneous surfaces are in contact with each other, or where the surface or end of a splint comes up into the axilla. As a preventive of BED-SORES, after the unbroken skin has been thoroughly washed with alcohol or some stimulating application, boric acid may be dusted over the entire back with great advantage. In the treatment of BURNS, boric acid is very useful. After the removal of the dressing, the granulations should be thoroughly cleansed with a warm saturated solution. Then the ulcerated surface may be dressed with an ointment of the strength of a drachm to an ounce of lard or simple cerate, spread on lint. This forms an agreeable dressing, and one that, owing to its antiseptic properties, can be borne a long time without becoming foul. With many surgeons, boric ointment has taken the place of zinc ointment as a bland and protecting dressing to granulating surfaces. A saturated solution of boric acid will often prove useful for a local dressing after the eschar made by the galvano-cautery or acid nitrate of mercury. These remarks are particularly applicable to the treatment of PHAGEDÆNIC CHANCRE. In CYSTITIS, where the urine has a tendency to become ammoniacal, the bladder may be washed out with solutions of boric acid, in strengths varying from five to ten gr. to the ounce of water, twice daily, with success. This procedure is of service in the treatment of CYSTITIS occurring in fractures of the spine. In injecting the bladder, it should always be borne in mind that this organ is normally distended by urine, drop by drop, from the ureters; consequently that all injections into the bladder should be made slowly, and never exceed four ounces in quantity. If this rule is carried out, but little difficulty or discomfort will result.

In the treatment of GONORRHŒA boric acid has been used in saturated solutions as an injection, but, as a rule, the results are not nearly so satisfactory as when a more decided astringent is used, *e. g.*, lead or zinc. W. C. Aboly (*Medical Record*, November 26, 1887) reports the results of treatment in GONORRHŒA by injecting into the urethra a paste made by mixing one part of boric acid with three parts of glycerin through a soft English catheter, inserted as far back as the prostate, and withdrawn slowly, filling the urethra with the paste. In this method it is important that the bladder should be previously emptied of all urine, as the paste causes in the urethra a desire to urinate, which, however, soon passes away. Of the 30 patients treated by Dr. Aboly 27 were cured. Of the remaining three, two had strictures which were afterwards dilated. H. A. Slocum (*Medical News*, December 18, 1886), has called attention to the use of *tampons* of cotton covered with boric acid, in the treatment of profuse and offensive LEUCORRHŒA, in dispensary patients at the Jefferson Medical College Hospital. Boric acid is also used with success in VAGINITIS. The tampons are allowed to remain in the vagina for forty-eight hours. In the treatment of ENDOMETRITIS, Duke (*British Medical Journal*, December 20, 1891) introduces into the uterus powdered boric acid by means of a specially prepared piston, the application being made every three or four days. He states that ten or twelve applications will usually cure a case of the disease. W. W. Potter has substituted boric acid for iodoform in gynæcological practice. He finds boric acid delays decomposition of uterine and ovarian discharges, and that a tampon charged with it can be retained for a week without discomfort or annoyance. In his experience it has been of service in cases where STERILITY existed; and he believes that it exerted such chemical action upon the uterine secretions that fecundation became possible.

Diseases of the Skin.—Boric acid being an antiseptic, the effort has been made to substitute it for carbolic acid in the treatment of diseases of the skin; but its action is not the same, although it is useful in certain cases when carbolic acid is inadmissible.

Powdered boric acid may be added to the ordinary dusting powders, starch, oxide of zinc, etc., employed in INTERTRIGO. In some cases it may be employed alone with advantage.

Lister's boric acid ointment is composed as follows:—℞. Acid. Boric., Ceræ Albæ, āā ʒij; Ol. Amygdalæ Dulcis, Paraffin, āā ʒiv. M.

Russell Sturgis (*Boston Med. and Surg. Jour.*, February 25, 1888) has used boric acid in INFANTILE ECZEMA with great success. When there is much vesiculation and discharge, he directs the crusts to be removed and then pure boric acid is dusted upon the moist and inflamed surface. The serous flow is increased for the first twenty-four hours, but then diminishes. The application is washed off and renewed twice daily for several days, and as soon as the skin is able to bear an ointment, one of boric acid, two drachms, and lanolin, one ounce, is employed, by which the acid is kept in contact with the skin better than if used in powder. The unruptured vesicles should be slit open.

Boric acid is also used in the treatment of HYPERIDROSIS, particularly in sweating of the feet, when decomposition takes place and BROMIDROSIS results. The stockings are soaked every evening in a three-per-cent. solution of boric acid, dried, and used the next morning. A change is made every other day.

Diseases of the Ear, Nose and Throat.—Boric acid, while one of the least irritating of the agents employed in checking DISCHARGES FROM THE MIDDLE EAR, is open to objection wisely urged against it that the discharge may convert the impalpable powder into a firm resistant plug. Instances are known in which pus has been retained in the middle ear, with resultant mastoid disease. In some cases (according to Pierce, *Med. Chronicle*, Manchester II, 34, 1885) it causes pain and after the first retention an increase of semi-purulent outflow. Schwartze (*Naturforscher Versammlung zu Berlin*, Sept., 1886, also *Archiv f. Ohrenheilkunde*) claims that even in solution, four grains to the ounce, the acid may bring about the same disastrous result by reason of the peculiarity that it forms with the secretion a tenacious mass and prevents the outflow of fluid from the middle ear. The drug appears to have its best opportunity for good in chronic otorrheal conditions in which the discharge is small in amount. After thorough cleansing of the affected parts a fine powder made from the crystals often has a most satisfactory effect. If the caking of the powder proves under any circumstances objectionable, the coarsely broken up crystals may be substituted. No similar limitation to the above is recognized in the selection of boric acid in affections of the AUDITORY MEATUS. An ointment (grains ten to the ounce) is useful in overcoming the irritation following the use of lotion of bichloride of mercury. It may be combined, indeed, with the drug last named, as an injection for acute ECZEMA of the external auditory canal. Combined with Hebra's diachylon (each one part to cosmoline two parts) it constitutes an admirable application for CHRONIC ECZEMA of the outer ear passage. In the treatment of ASPERGILLUS boric acid proves to be efficient. It is especially useful after the use of a bichloride of mercury lotion. Since an opening in the tympanic membrane is present as a rule in cases in which the parasitic plant is lodged in the ear, the same precautions are demanded in using the acid as in OTORRHEA. Boric acid is useful in the local treatment of TONSILLITIS, either alone or combined with a vegetable astringent. The pure powdered acid thrown into the nose causes pain and lachrymation. The untoward effect may be controlled by the addition of a small quantity of morphine. It is usually ordered diluted two-thirds with an indifferent excipient. It is especially useful in CHRONIC RHINITIS of children. The plug of cotton used in tamponing the nose retains its purity if previously saturated in a solution of boric acid, ten grains to the ounce of water. *L' Union Médicale*, Jan. 10th, 1891, contains the following prescription: Powdered boric acid, drachm one-half, combined with an equal quantity of salicylate of sodium to which one grain of cocaine is added: to be used as a snuff in HAY FEVER.

In the pharynx boric acid lotions may be used in the proportion of eight grains to the ounce of water. Or the powder, either pure or diluted, can be thrown into the naso-pharynx. J. C. Mulhall (*Trans. Am. Laryn. Ass'n*, 1889) recommends that boric acid (as much as can be taken up by the liquid = 16 grains to the ounce represents, at ordinary temperature, a saturated solution) be added to Baudry's solution of carbolic acid and compound solution of iodine in the local treatment of DIPHTHERIA. According to Da Costa ("Potter's Therapeutics") boric acid holds second place only to thymol in the treatment of this disease. S. Johnson, of Baltimore, strongly recommends boric acid in five per cent. solution as a gargle for acute pharyngitis.

Pastilles of boric acid are prepared by adding two grains to each mass of glycero-gelatin. Glycero-gelatin is a ten per cent. solution of gelatin in glycerin, which solidifies on cooling.

Boric acid, two grains; glycerin, two minims, added to glycero-gelatin, one scruple, is recommended by Whistler for APHTHOUS AFFECTIONS of the mouth and throat.

Diseases of the Eye.—Boric acid has been extensively used in ophthalmic surgery as an antiseptic, and at one time was considered an efficient germicide. The latter claim has been generally abandoned. Sattler, in a series of bacteriological experiments with the various washes used by ophthalmic surgeons as antiseptics, proved boric acid to be entirely destitute of germicidal properties (*Annales d' Oculistique*, t. 91, p. 165.) It is still classed among the antiseptics, though its exact position is perhaps not yet defined, and it is at least a valuable aseptic application whose unirritating character especially recommends it in operations upon the eye. During EXTRACTION OF CATARACT and other operations on the eyeball, the conjunctival sac may be freely and frequently douched with a warm saturated solution (about one part to thirty).

Boric acid is much used in the treatment of CONJUNCTIVITIS, either alone or in combination with borax, alum, sulphate of zinc, or cocaine.

Finely powdered, it is sometimes dusted on the inner surface of the eyelid in TRACHOMA.

Borated lint is made by dipping lint into a saturated solution of boric acid. It is not a good application for the eye, as it becomes stiff and starchy in drying.

BOROGLYCERINUM. Boroglycerin.

Boroglycerin is made by adding boric acid to glycerin in the presence of intense and prolonged heat. Its introduction is credited to Barff. Boroglycerin is a solid, containing about 40 per cent. of boric acid. It is readily soluble without precipitation in glycerin or water, and hence affords a convenient means of presenting any desired proportion of boric acid. A 50 per cent. solution of boroglycerin is a glycerin of syrupy consistence. In this form it is kept on hand by druggists, and dispensed under the name of "Glyceritum Boroglycerini."

Boroglycerin is seldom used in full strength. For the treatment of open wounds it is a non-irritating and powerful antiseptic. Mr. Barwell employs it in a watery solution for washing out ABSCESS CAVITIES. Sir Henry Thompson speaks highly of boroglycerin used in a watery solution as an injection for CYSTITIS. It may be used in the proportion of one to fifty of water.

Diseases of the Ear, Nose, and Throat.—The indications for the use of boroglycerin are not distinct from those of boric acid. It is a favorite application with some physicians. It appears to be especially adapted to APHTHOUS OR HEMORRHAGIC ULCERATED SURFACES IN THE NASAL CHAMBER. It is an admirable application to the lines of incision in the after-treatment of operations on the nasal septum.

Diseases of the Eye.—Boroglycerin (50 per cent.) is a useful application in GRANULAR OPHTHALMIA, painted on the everted lid with a camel's hair brush or a small pledget of absorbent cotton. Gauze saturated with a 25 per cent. solution makes a clean and neat dressing after operations on the eyelids.

ACIDUM CARBOLICUM. Carbolic Acid. Phenol. Phenic Acid. Phenylic Acid. Phenylic Alcohol.

"A product of the distillation of coal tar between the temperatures of 180° and 190° C. (356° to 374° F.)." U. S. P.

Several grades are in the market, of which No. 1 is the purest made by the manufacturer whose name may be attached. Nos. 2, 3, 4, and 5 are less and less pure according to number. Nos. 1 and 2 are both crystalline; Nos. 4 and 5 contain varying proportions of water and cresylic acid, and are quite dark in color. They contain, also, proportions of tar oils and tar acids. The crystalline acid become pinkish or brown under exposure to light or air. The liquid carbolic acids, even when sold as pure, contain about ten per cent. of water or alcohol added to liquefy the crystalline acid. Carbolic acid is "soluble in 20 parts of water at 15° C. (59° F.). It is very soluble in alcohol, ether, chloroform, benzol, disulphide of carbon, glycerin, and fixed and volatile oils." U. S. P. The No. 1 or the No. 2 are the only acids that should be used for surgical purposes, as they are the only ones that entirely dissolve in water. The crystallized acid is best liquefied by putting the bottle in warm water, and upon its liquefaction, adding five or ten per cent. of water or alcohol to maintain it in a fluid condition. Crude carbolic acid (Acidum carbolicum crudum) is also official in U. S. P., with the thought that it would be used externally or for disinfection.

A carbolated cotton is prepared by steeping absorbent cotton in a solution of carbolic acid.

Carbolic acid enters into the composition of *Dobell's solution*, if, indeed, its value does not almost entirely depend on it. The following is the formula: ℞. Sodii boratis, one drachm; glyceriti acidi carbolici (U. S. P. 1870), two drachms; sodii bicarbonatis, one drachm; water, one-half pint.

Carbolic acid is a stimulant and anti-fermentative. It rather prevents the formation of gases than destroys the odors which are caused by their presence. In weak solution it produces a peculiar cooling and analgesic impression. In a pure form it is a caustic. While carbolic acid is a parasiticide, the germicide properties often claimed for it are not uniformly accepted. Carbolic acid closely resembles creasote in its general properties, but is more powerful (Mandl). Concentrated preparations coagulate albumin and gelatin. It should never be prescribed in concentrated forms, notwithstanding the inconvenience of using large quantities of weak solutions. Numerous accidents have occurred by its being taken in mistake for other medicine, and severe caustic effects ensue by its accidental application to the lining membrane of the nose and throat. The antidotes to burning or poisoning by carbolic acid, either internally or externally, are solutions of a soluble sulphate, *e. g.*, sulphate of magnesium and sulphate of sodium. Saccharate of lime is also highly commended as an antidote, but this is not usually to be found in the shops.

General Surgery.—In antiseptic surgery carbolic acid for a long time held the foremost place, until the more general adoption of solutions of mercuric chloride. It still plays an important part in the antiseptic mode of treatment, particularly in cases in which mercurials cannot be used. Owing to the sharp corroding effect of all solutions of these salts on metallic substances, solutions of carbolic acid are to be preferred in disinfecting instruments prior to an operation.

As an antiseptic carbolic acid possesses the essential requisite of being a poison to those low forms of life which determine putrefaction, and it retains this power, even when diluted to such a degree as to be almost entirely unirritating to the tissues. It is also volatile, and its vapor is efficacious as an antiseptic.

Koch finds that chlorine, bromine and corrosive sublimate are decidedly more efficacious in destroying the BACILLUS SPORES OF SPLENIC FEVER than carbolic acid. Where gases or heat cannot be employed, he recommends a mercuric salt, such as the mercuric chloride, sulphate or nitrate. Of these a solution of one part to a thousand of water kills the resisting spores in ten minutes, and one part in 15,000 is strong enough to kill micro-organisms. To accomplish the same result a very much stronger solution of carbolic acid must be employed. The ordinary five per cent. (or 1 to 20) solution, which is used in the majority of surgical operations, requires more than a day to destroy the spores of anthrax. To use solutions stronger than this is impracticable, because of the benumbing influences that are produced on the hands of the surgeon, and also the increased danger of absorption. These results are, however, rare, since it is customary to regard a three per cent. solution in water as able to destroy all germs in a few seconds or minutes. The surgeon washes his hands and cleanses his instruments in such a solution, believing that he has thereby rendered them free from living organisms. We see now, however, that beyond the mere mechanical effect of washing, such precautions are of no avail whatever in the case of organisms as resistant as are anthrax spores.

Carbolic acid cannot, therefore, be regarded as a reliable disinfectant, since it has not the power of destroying resisting spores under the conditions of practical disinfection. Schotte and Gaertner have shown that to destroy putrefaction-organisms in dry objects, 15 grains of carbolic acid vapor to the cubic metre are required, so that disinfection of rooms by this method is impracticable.

Carbolic acid dissolved in oil and alcohol is inert. Anthrax spores were found to be unaffected after lying for upwards of three months in a five per cent. solution of carbolic acid in oil, and equally so by seventy days exposure to a five per cent. solution in alcohol. Even the sensitive anthrax bacilli were not destroyed by a five per cent. solution of carbolic acid in oil.

If carbolic acid comes in contact with substances containing water, for instance the tissues of the body, doubtless part of it will be taken up and exert some antiseptic action. In all other cases, as when it is sought to disinfect dry objects, such as instruments, silk, cat-gut, etc., by carbolized oil, there is no effect on even the least resisting micro-organisms, beyond that due to the oil itself.

Bearing in mind that carbolic oil is inert, and that a two to five per cent. solution can make no impression upon spores in the brief time occupied by a surgical operation, and further that in order to prevent bacterial growth the carbolic acid must be present in the proportion of 1 to 400, it cannot any longer be a matter of surprise that in spite of the most scrupulous antiseptic precautions, bacteria often appear under a carbolized dressing.

The strength of the two solutions of carbolic acid that are in general use in surgery is 1 to 20 and 1 to 40; the former is used for washing and disinfecting recent wounds, suppurating surfaces, abscess cavities, etc. It is also used in the spray diluted to half strength with steam (1 to 40). The weaker solution is used for a bath to place instruments in during operation. It is objectionable, as it in time discolors bright instruments, and soon destroys their cutting surfaces. For this purpose we have abandoned its use during the last year at the Episcopal Hospital in Philadelphia, and substituted the boiling of instruments in distilled water (made slightly alkaline with soda or ammonia, which prevents in a measure the discoloration brought about by boiling), trusting to the purifying effect of moist heat. In using the stronger carbolic acid solution, surgeons find great inconvenience from the unpleasant benumbing effect produced by having the fingers moistened by it even for a short period of time, in cold weather causing the hands to chap greatly. The more recent practice of Listerism is to use carbolic acid spray so as to keep the wounded surfaces under a fine mist of carbolic acid (1 to 20) diluted with steam to 1 to 40, while carbolized oil cat-gut (by preference that prepared in chromic acid) is used for the ligation of arteries. The dressing in vogue is (1) specially prepared oiled silk on which a number of coats of dextrin have been painted, as a protection from the irritating effects of the acid; (2) a coarse gauze made of cheese-cloth, impregnated with a mixture of carbolic acid, paraffin, castor oil, resin and alcohol. About eight layers of the gauze are laid over the wound, which has previously been thoroughly cleansed with the 1 to 20 solution. Over this is laid a piece of mackintosh, wrung out of a solution of the same strength, and the entire dressing is retained by means of a bandage made from the gauze.

For a number of years a solution of carbolic acid in olive oil (1 to 10) has been used in the Pennsylvania Hospital. Lint saturated with this mixture is laid over the wound. Although worthless compared to the more modern antiseptic dressings, it is an exceedingly bland, clean, and pleasant application, especially to some varieties of BURNS and for the packing of sinuses about the rectum after operations for the cure of FISTULA. A similar preparation of carbolic acid and oil, though weaker (1 to 20) is largely used to anoint instruments in urethral surgery, being much more convenient than cosmoline, the slight amount of carbolic acid having a sedative effect on the urethral mucous membrane.

"*Lund's Oil*" is a favorite preparation in England for ANOINTING CATHETERS. It consists of olive oil and castor oil, each one ounce; carbolic acid, one drachm. It will be found usually more convenient in making solutions of carbolic acid to first dissolve it in glycerin, as then the globules of the acid are more readily broken up when they come in contact with water. In making solutions for baths for instruments, etc., (1 to 40 and 1 to 20) the strength can readily be judged very accurately by the taste, by applying a little of the solution on the end of the finger to the tongue; by this means much time and trouble are saved.

Carbolic acid locally applied is an anæsthetic. A. H. Smith painted on his forearm a spot an inch in diameter, with an 85 per cent. solution of carbolic acid. For a minute it caused a slight burning, then the skin became quite numb, whitened, and shriveled; at this point he made an incision one-half an inch long without feeling the knife, the wound healing as usual. Three hours afterward he thrust, without pain, a needle into the skin; and next he applied a blister to the carbolized skin without causing pain or vesication. He found that in incising WHITLOWS this application greatly lessened the pain.

A strong carbolized solution is an exceedingly good application to relieve the pain in superficial BURNS, care being taken to guard against absorption, should the surface be of large extent.

Hüter has used in his clinics carbolic acid hypodermically in the treatment of ERYSIPELAS (carbolic acid, one grain, distilled water, 80 minims). This solution is used in traumatic erysipelas; five or six injections of 16 minims each are made in the healthy skin at several points around the erysipelatous patch. They are repeated during the day, and the treatment is pursued until the fever subsides and there is an arrest of the erysipelatous inflammation.

Carbolic acid topically applied is useful in ANTHRAX. It may be injected into the neighborhood of the pustule (two to three minims of a two per cent. solution), twice a day for two or three days, a compress soaked in a solution 1 to 20 being frequently applied. Some advise painting over the part with strong acid.

Many attempts have been made to introduce carbolic acid as a substitute for the tincture of iodine in the treatment for the radical cure of HYDROCELE. It was a favorite injection with the late R. J. Levis, at the Pennsylvania Hospital, and has also been employed at the Massachusetts General Hospital. It may be used with advantage in very small hydroceles, employing from 20 minims to one-half ounce in glycerin. It is less severe, but not nearly so reliable an injection as the tincture of iodine, recurrence after its employment being much more common. It should never be used if chronic orchitis or much thickening of the sac is suspected, or in old or enfeebled persons. In NEURALGIA, relief may be obtained by painting the course of the painful nerve with a strong solution of carbolic acid. It has also been advised to inject hypodermically small quantities of the drug in close proximity to the seat of pain. In an obstinate case of SCIATICA, Dr. Levis painted the course of the sciatic nerve with the pure acid, with the effect of producing great amelioration.

Diseases of the Skin.—Carbolic acid is much employed in the treatment of diseases of the skin, chiefly as an antipruritic, in which it is surpassed by no other remedy with which we are acquainted. Bulkley (The Local Use of Tar, etc., in the Treatment of Skin Diseases.—*Arch.*

Sci. and Pract. Med., April, 1873), believes this to be due to its stimulating effect and also to a specific benumbing of the sensory nerves.

Pure carbolic acid acts powerfully upon the skin, but its effects are superficial. It coagulates the albumin and so produces a white surface, the depth of which may be increased by repeated applications (Bulkley). Dr. Bill, of the United States Army, has used carbolic acid as a local anæsthetic, having been able to lay bare the radial artery of the arm, in his own case, without pain. We have now, however, better local anæsthetics (see Cocaine, Rhigolene). Bill first applies, for fifteen minutes or half an hour, a weak solution of carbolic acid, either by compresses or soaking the whole part, then traces with a camel's hair brush dipped in the strongest acid the course of the intended incision (*Amer. Jour. Med. Sci.*, 1870; October, 1870, p. 573).

As an antiseptic in FOUL and INDOLENT ULCERS a lotion of eight to fifteen grains to the ounce is often useful. It may also be added to the *linimentum calcis* (See Calx.) used in BURNS.

In PRURITUS and CHRONIC ECZEMA carbolic acid is one of the most efficient antipruritic remedies we possess. A lotion containing three drachms of carbolic acid, an ounce of glycerin and a pint of water will be found most useful in a great number of pruritic skin diseases.

Combined with caustic potassa carbolic acid acts not only as an antipruritic but also as a discutient, aiding in the disappearance of INFILTRATED PATCHES of ECZEMA. The following formula, suggested by Bulkley, we have often used with satisfactory results: ℞. Acid carbolic, ʒij; Potas. caustic, ʒj; Aquæ, ʒv (by weight). M. Ft. Sol. It should be used much diluted at first, and afterwards strengthened as the patient can bear it.

Carbolic acid has been largely used as a parasiticide. In the animal parasitic diseases we have so many other satisfactory remedies that we need rarely have recourse to carbolic acid excepting to combat the PRURITUS which sometimes follows the disease itself.

In TINEA TONSURANS, however, carbolic acid is one of the most efficient remedies. It may be used in various strengths, combined with glycerin. In older children the carbolized glycerin, one part of carbolic acid to two of glycerin, may be applied to the patches of RINGWORM, while a weaker solution, one part to eight of glycerin, may be applied to the scalp generally as a preventive. Weaker solutions should be used in younger children.

In DERMATITIS CONGELATIONIS (chilblain), Lassar recommends the following: ℞. Acid carbolic., grs. xvss; Ung. plumbi, Lanolin, āā ℥v; Ol. amygdali, f℥iiss; Ol. lavanduli, gtt. xx. M.

Bulkley has often used, with very good results, an ointment of carbolic acid, ℈j to ℥j, in Frosted Fingers and Toes (Erythema Caloricum) with ulceration, the pain subsiding at once and healthy reparative action ensuing.

Fränkel (*Wien Med. Presse*, October, 1888), recommends carbolic acid for the removal of Warts.

The skin surrounding the wart should be covered with cotton, and thus protected. Then by means of a glass rod the liquid carbolic acid should be applied to the wart, and allowed to dry. No pain is felt. In a few days a part of the wart will fall off; renew its application until all has been removed.

Diseases of the Ear, Nose, and Throat.—In the treatment of Otorrhea, carbolic acid acts as a disinfectant and stimulant in lotions of strengths varying from one to five drops of the acid to an ounce of water. An equal quantity of sulphate of zinc may be added. A two per-cent. solution has been instilled in the exposed meatus to relieve the pain of Otitis. The weaker solution alone should be employed in Acute Perforations of the Tympanic Membrane. Objections are urged against its use, from its liability to irritate the skin of the external meatus. The pure acid may be applied with a probe to Granulations of the Mucous Lining of the Middle Ear. H. Hartmann (*Deutsch med. Wochenschrift*, No. 13, 1887, p. 414), recommends the use of a 10 per cent. solution of carbolic acid and glycerin in acute Otitis Media; it not only reduces discharge, but relieves pain.

It is not without its advocates in Diphtheria. A pigment of three grains to the ounce of water, or one part of the acid to three or five of the alcohol, may be used. Gaucher (*Brit. Med. Journal*, November 23, 1889, p. 1185), claims that a pledget of cotton wrapped on a cotton carrier, soaked in a preparation of four scruples (5.2 grammes) of carbolic acid, three drachms (11 grammes) of alcohol, and one-half ounce (15.5 grammes) of castor oil, pressed on the false membrane, desiccates it, and renders the removal easy; after its removal the solution may be employed once a day. M. Broudel (*Gaz. des Hopitaux*, December 11, 1886), employs a somewhat similar preparation. Falkenheim (*Verein für wissenschaftliche Heilkunde in Königsberg*, November 5, 1888), injects the acid into the substance of the tonsil in this disease.

As an inhalation or spray, in strength of four to eight grains to the ounce, carbolic acid is used in the treatment of Croup. A five per cent. solution is occasionally used as a spray in Bronchitis. In all affections of the respiratory passages in which there is great fetor, arising from constantly renewing sources, as in Syphilis, Carcinoma of the Larynx, Gangrene of the Lungs, Bronchorrhœa, Pyopneumothorax, etc., carbolic acid inhaled in proportions of three to six drops to half a pint of water gives good results.

The value of the acid in NASAL AFFECTIONS has led to combinations being made with other agents of repute. Thus Hager adds one part of the acid to three of absolute alcohol, one of caustic ammonia and two distilled water, the mixture being preserved in a dark stoppered vial. The preparation is known as "*Hager's Anticatarrhal Mixture.*" A few drops on blotting paper folded in a cone shape is held to the nose, the eyes are closed and deep inspirations are taken.

Percy Boulton has proposed to combine the properties of carbolic acid and iodine as follows: ℞. Tinct. iodinii comp., ♏ xlv; Acid carbolic cryst., ♏ vj; Glycerini, ℥ j; Aqua. destillat., ℥ v.

A peculiar penetrating odor results from this union which to many persons is disagreeable. The physician's office and dwelling becomes fairly saturated with it if the prescription is in common use. A similar preparation to the above is in high repute in Germany for treatment of FISSURE OF THE TONGUE. G. Lefferts modifies the mixture by adding to a drachm each of carbolic acid and iodine, one ounce each of powdered charcoal and camphor. A sufficient quantity of benzoin is added to make a paste, and 20 drops of oil of lavender are added to correct the odor. The preparation is to be inhaled through the nose from a wide-mouthed, glass stoppered bottle. Moure (*La Tribune Médicale*, 1889,) adds 15 grains of carbolic acid to 45 of crystallized resorcin, largely diluted in water to which a small proportion of glycerin has been added. (300 grains aqua and 500 grains glycerin.)

Carbolic acid can be used in great strength in the nose when applied in small quantity to selected surfaces. But in the form of the lotion the strength must be graded by the amount which can be borne comfortably upon the lips and the pharynx. Thus, a pigment of 10 to 20 grains to the ounce might be applied to the interior of the nose with safety when a strength so great would excite irritation of the lips and the throat.

In directing carbolic acid to be used in the form of a nasal bougie, one-half grain is usually introduced in each mass. Boulton's solution may be used in this way: one-quarter minim of the deliquesced crystals is added to five minims of Lugol's solution.

Carbolic acid has been employed by E. F. Henderson (*St. Louis Med. and Surg. Journal*, Jan. 1886—28) as an injection to HYPERTROPHIES OF THE INTERIOR OF THE NOSE. Rumboldt (*St. Louis Medical Archives*, 1873) places carbolic acid at the head of the list of remedies for local application in the treatment of ACUTE and CHRONIC INFLAMMATION OF THE THROAT AND NOSE. He recommends from two to five grains to the ounce of water. In his judgment a slight smarting sensation should ensue after each application.

Crystals of carbolic acid rendered soluble by heat are used in treating sinuses leading through gum tissue to bone. Cure of PYORRHEA ALVEOlaris can be effected by the persistent use of this agent. It is also known that Alveolar Abscess can be successfully treated if the pure acid can be forced through the root in the sac of the old abscess and allowed to escape by the fistulous tract. Thorner (*Trans. Ohio State Med. Soc.*, 1889), for Tonsillitis, paints the parts with a preparation of carbolic acid, tannic acid, each 30 grains to the ounce, combined with a small proportion of morphine. The hæmostatic properties of carbolic acid have received little attention. As a coagulant of albumin, and astringent it doubtless will have value in concentrated preparations. A. Jamison (*Brit. Med. Jour.*, April 21, 1888) found a preparation of one-half drachm of the acid to an ounce of glycerin checks slight Bleeding from the Pharynx.

A solution of carbolic acid, one to forty, will often be found a very pleasant mouth-wash in Cancerous Disease of the Tongue, and other foul conditions involving the buccal cavity.

A mixture of carbolic acid and collodion is useful in Toothache due to an exposed and inflamed pulp. A jelly is made by melting some crystalline carbolic acid in a test tube, then adding an equal part of collodion. A portion of this preparation on cotton is inserted into the cavity of the painful tooth, with sometimes aggravation of the pain, but in a few seconds it begins to diminish and then soon ceases (Ringer).

In Chronic Laryngitis accompanied with diminished secretion carbolic acid is one of the best topical remedies; a mixture of one-half to a drachm of the crystals to an ounce of glycerin is prepared and the remedy applied directly by a brush or cotton pledget to the interior of the larynx. Usually, however, the acid is used by inhalation to any point below the level of the pharynx. Twenty drops to forty in a pint of water with a small amount of glycerin is inhaled at 140° F. for correction of Fetor and as a soothing preparation in Syphilitic Ulcerations and Carcinoma. But twenty-five to thirty grains to the ounce have been recommended (one-fourth to one-half) by Moritz. (*St. Petersburg Med. Wochen.*, 1876, 39.)

As we have seen, the vapor from stronger preparations of the acid may be drawn within the respiratory passages in many of its inflammatory states. As an inhalant in Whooping-cough Sajous recommends the formula: ℞.—Acidi carbolici, ♏ij; Alcoholis, Succ. conii, āā ♏xx; Aquæ, Oss, at 140° F.

Lozenges and pastilles of carbolic acid contain a fourth of a grain to a grain of the drug.

An application of carbolic acid of a 30-per-cent strength, employed by a practitioner who desired to remove by its means an exudation upon the tonsil, which was in a state of follicular inflammation, immediately caused a light opalescent color to appear on the parts; the uvula became irregularly spotted with patches of a dense white hue and the velum became œdematous. The agent had no effect upon the exudation. Two conclusions can be drawn from such an imprudent application; first, it entirely failed to accomplish the object which the practitioner had in view, and secondly, it masked the characteristic appearance of the disease.

Inhalations of carbolic acid mingled with air at a high temperature are said by A. E. Samson ("Antiseptic System," London, 1871, p. 91) to possess decided advantages over any other means of using this agent as a local application in PHTHISIS or BRONCHITIS. The carbolic acid is liquefied by the addition of alcohol and the liquid allowed to fall a few drops at a time upon an appropriately heated surface. An ordinary thick tea-cup or egg-cup, which has previously been heated in the oven or by allowing a small quantity of alcohol to burn in the cup until it is extinguished, is first prepared, then the mixture of carbolic acid and alcohol is poured a few drops at a time while the patient inhales the resulting vapor. The first effect is a slight disposition to increase the cough; soon, however, tolerance is established; the COUGH is diminished, the EXPECTORATION is decreased, and the FETOR is corrected. The treatment is not adapted to instances in which hæmoptysis is likely to occur. Tissié (*Revue de Laryng. d'Otol. et de Rhinol.*, May 1, 1891) employs carbolic acid in combination with aqua ammonia and alcohol as an inhalant. Five grams each of the acid and ammonia water are added to ten grams of alcohol in 15 grams of water. A few drops are poured upon a piece of absorbent paper and inhaled.

Diseases of the Eye.—Carbolic acid being more irritating and less efficient than some other antiseptics, is not much used by ophthalmic surgeons except to disinfect their hands and instruments. For the latter purpose a four per cent. solution is used. The keen edges of delicate knives, however, are liable to be impaired by it, and boiling water or alcohol with careful wiping with absorbent cotton is preferable.

The late Dr. Williams, of Cincinnati, strongly recommended carbolic acid as a caustic in the treatment of INDOLENT OR SLOUGHING ULCERS OF THE CORNEA. He applied it by means of the end of a small probe dipped into the pure acid.

"*Glycerite of carbolic acid*" (one part to four—not official), has been recommended as an application to GRANULAR LIDS, but has not met with general acceptance.

"PHENOL SODIQUE."

"Phenol Sodique" is a proprietary article. It is here conveniently treated under the general heading of carbolic acid. In its preparation a crude carbolic acid-phenol, together with a group of hydrocarbons, ethers and acids (notably cresylic acid) obtained by the distillation of coal tar, is neutralized by the addition of soda, the result giving a non-irritating sedative mixture. Lint or gauze may be saturated with "phenol sodique," diluted with water, and used in the treatment of WOUNDS, ABRASIONS, etc. Undoubtedly "phenol sodique" possesses many of those antiseptic properties which are found through the entire series of the phenylic compounds. In the treatment of BURNS "phenol sodique" added to cosmoline, equal parts, is regarded by many practitioners as a cleanly, sedative dressing, containing many of the properties of carbolic acid.

ACIDUM CHROMICUM. Chromic Acid.

Chromic acid, or, more properly, chromic anhydride, is "in the form of anhydrous, acicular crystals, of a brilliant crimson red color, and of acid metallic taste, deliquescent, and very soluble in water, forming an orange red solution."—U. S. D. "On contact, trituration, or warming with strong alcohol, glycerin, spirit of nitrous ether, and other easily oxidizable substances, it is liable to cause sudden combustion or explosion."—U. S. P. Chromic acid is occasionally contaminated with sulphuric acid, sometimes containing as high as seven per cent. It should be practically entirely free from sulphuric acid, as is contemplated by the Pharmacopœia.

Pure chromic acid and solutions of about two drachms to the fluidounce of water are escharotic. Thus used this agent is a powerful caustic. It oxidizes the tissues and abstracts their moisture. Its action is slow. When used on a surface the sensibility of which is unobtunded chromic acid is followed by burning pain which, however, is of shorter duration than that of most caustics. Weak solutions are stimulant and alterative.

General Surgery.—Chromic acid is commonly used in solution with water or in a paste made with charcoal and water. It was introduced as an escharotic by Mr. Marshall, as a substitute for nitric acid and acetic acid, for the removal of SYPHILITIC WARTS, VEGETATIONS, and SMALL DERMAL GROWTHS. Different strengths may be employed according to the effect that is to be produced; two drachms to the fluidounce of water will, as a rule, be a sufficiently strong destructive agent. The solution is best applied by means of a pointed glass rod, or, where a large quantity is required, by a glass tube drawn to a point. Only so much should be applied as will saturate the diseased growth, avoiding the surrounding healthy mucous membrane or skin. Although it may not destroy the skin or mucous membrane, it may give rise to an unnecessary amount of inflammation. Any superfluous acid may be removed with a piece of wet lint. We have often found that a small piece of adhesive plaster, in which a hole has been cut large enough to allow the growth to protrude through it, will protect the surrounding skin from the action of the agent.

The first effect of the acid, when applied to WARTS, is to produce a slight pain. If, however, an ulcerated surface is touched, the pain is of a burning character, but not so intolerable as that produced by nitrate of silver or nitric acid. If the pain should be severe, the application of olive oil will at once alleviate it. After its use, the best immediate dressing is dry lint applied to the surface of the growth, and after this zinc ointment. Under the influence of chromic acid morbid growths rapidly dissolve or waste away. In some cases one application will suffice, but if the warts are large repeated cauterizations are necessary. In using this method care must be exercised, as in several instances death has followed the application of chromic acid to a large number of condylomata at a single sitting. We have found chromic acid of great value in treating small Salivary Fistulæ. It is applied by heating a delicate silver probe almost to redness and inserting it into the crystals of the acid, which melt and adhere, leaving a smooth coating of chromic acid on the instrument. This can be inserted along the fistulous tract, which in a short time will start up a growth of granulations, closing the sinus.

Sessile Piles, where there is a bright granular patch of mucous membrane which bleeds at the slightest touch, can be cured by the application of chromic acid. After the patient has been etherized, the sphincter stretched, and the patch exposed with the speculum, the surface is well dried with cotton and the acid is painted on with a glass brush, care being taken that none comes in contact with the skin or margin of the anus. A morphine suppository is then introduced to prevent pain or spasm. A superficial slough usually comes away in the course of a few days without being noticed, and the granulating surface left contracts and obliterates the deeper parts of the vessels. (Moullin.)

Chromic acid is used in the preparation of Catgut Ligatures, in order to make them resist the absorbing influences of the tissues. They are prepared in the following manner: Place catgut in ether for forty-eight hours; then immerse in the following for forty-eight hours, and place in dry, sterilized, tightly-closed vessels, or carbolic acid, 1 to 20:—℞. Acid chromic, gr. ss; Acid carbolic, gr. c; Alcohol, f℥j; Aquæ, f℥xj.

Diseases of the Skin.—Chromic acid is sometimes used in substance upon the surface of Epitheliomatous and Lupoid Ulcers. In Tinea Circinata it is applied in solution, one drachm of the acid to an ounce of water. A single application usually suffices. It is also useful in other Vegetable Parasitic Skin Diseases.

In Condylomata and Verruca Acuminata a solution of two drachms to the ounce of water is effectual, though somewhat painful. In ordinary Corns and Warts this solution, or even a stronger one, may be used with advantage. It has also been employed as a stimulant in Chronic Eczema, but we think that other stimulants, as solutions of potassa caustica, nitrate of silver, tincture of cantharides, lactic acid, etc., are better.

Chromic acid has been successfully employed in the treatment of Hyperidrosis, particularly in sweating of the feet. The application of a

10 per cent. solution (gr. j to f℥j water), repeated every three or six weeks, is said to be sufficient to prevent any inconvenience. A limited experience has shown us that this remedy, although useful, is not certain to cure the affection. A further experience may, however, establish its usefulness among other remedies.

Chromic acid has also been recommended as an application to the interior of CYSTIC TUMORS, and would, therefore, probably prove valuable in sebaceous tumors of the skin.

Diseases of the Ear, Nose, Throat, etc.—Chromic acid is used in the mouth, throat, and nose, for caustic or stimulant purposes. As a caustic, the acid is valuable in the treatment of FIBROUS HYPERTROPHIES and POLYPOID GROWTHS of the mucous membranes. It is of special efficacy in the reduction of HYPERPLASIA OF THE TURBINALS. Owing to the fact that it contains no sulphuric acid, Merck's preparation of chromic acid is to be preferred. The crystals can be crushed on the end of a delicate spatula and carried to the selected spot, or fused on the end of a metallic probe, as in the case of the nitrate of silver. Bresgen provides a probe the end of which is covered with cotton ; on this point he lays some crystals of the acid and again covers the whole with a layer of cotton ; when applied a short time to the required spot, the acid dissolves and the desired end is obtained. A. W. MacCoy has devised an instrument which conceals the fused acid borne on the end of a stylet within a cannula composed of a spiral spring of composition metal. The entirely deliquesced crystals which constitute a concentrated solution of the acid is of caustic strength, but is much milder in its effects than the fused or crushed crystals. According to Squibb (*The Ephemeris*, July, 1883), chromic acid is an active oxidizing agent. The product of oxidation is an insoluble and inert oxide of chromium. The caustic effect is strictly self-limited. So powerful an agent cannot be used without careful attention to details. It is necessary to remember that the acid must not be applied to large surfaces at one sitting ; that the part must be freed from mucus so as to prevent this secretion acting as a medium to distribute an irritating fluid elsewhere. In making applications to the larynx it is necessary to remember that enough of the dissolved acid may pass into the pharyngeal mucus and be swallowed to induce nausea if not a toxic impression. The parts therefore should be flushed with a weak alkaline solution directly after the application is made. In intra-nasal use the acid is capable of exciting *artificial catarrh*, accompanied with edema. The odor is unpleasant and with some patients prohibitory.

The caustic effect is active when exhibited on NASAL POLYPUS. F. Donaldson (*Arch. of Laryngology*, 1883, 4,175) carries the acid by means of pointed glass probes directly into the substance of the growth. Verneuil praises chromic acid in TUBERCULOSIS OF THE TONGUE and ICHTHYOSIS.

In the treatment of ENLARGED TONSILS B. Frænkel thrusts fine needle points into the crypts. Woakes (*Lancet*, 1890) uses a saturated solution for injection into RANULA. A cure is rapidly accomplished.

Chromic acid is also of good repute in the treatment of CHRONIC LARYNGITIS. Sajous believes it to be especially indicated when the affected parts are covered with arborescent vessels. The network of vessels is destroyed without causing cicatrices or plastic inflammation of the deeper tissues. W. C. Jarvis (*Trans. Laryngology*, 1884) especially recommends this agent for the treatment of LARYNGEAL PAPILLOMATA. The remedy has distinct limitations.

Solutions have also been used as lotions for the nasal passages in HAY-FEVER. One part to twelve may be applied to granulating surfaces. H. McNaughton Jones mentions a lotion of ten to twenty grains to the ounce for a stimulating wash to the naso-pharynx. A lotion of ten grains to the ounce has been proposed by R. A. Sterling (*Australian Med. Journal*, April, 1885) for SYPHILITIC ULCERS of the throat and nose. Moullin recommends for CHRONIC SUPERFICIAL GLOSSITIS, chromic acid, gr. xx–f℥j, painted over the tongue once or twice a week: this will be found a satisfactory means of dealing with the condition. In SYPHILITIC LARYNGITIS the acid may be used with advantage, according to Escambert, in the proportion of one part of the acid to eight of water.

Diseases of the Eye.—Chromic acid may be used to remove WARTS ON THE EYELIDS or as an application to small EPITHELIAL ULCERS. It is applied by means of a splinter of wood or a glass rod, or a small pledget of absorbent cotton on the end of a fine probe.

ACIDUM CITRICUM. Citric Acid.

"Colorless, right rhombic prisms, not deliquescent except in moist air, efflorescent in warm air, odorless, having an agreeable, purely acid taste, and an acid reaction." (U. S. P.) It is soluble in three-fourths of its weight of cold and half of its weight of boiling water; in its weight of alcohol and half its weight of boiling alcohol; insoluble in pure ether, and in chloroform, benzol, and benzin. It is apt to be adulterated or substituted by tartaric acid. This fraud is easily detected by the addition of a solution of potash to a solution of the suspected acid, when if tartaric acid is present, bitartrate of potassium will be precipitated.

Diseases of the Skin.—Citric acid, as well as juice of the lemon, or lime, have been employed in the local treatment of several different skin affections. The pain accompanying some forms of EPITHELIOMA is said to be assuaged by lotions containing five or six grains of citric acid to the ounce of water.

Lemon or lime juice, pure or diluted, has been employed to loosen the fatty plugs in COMEDO, to hasten the cure in TINEA KERION, to allay the itching and stinging of URTICARIA, and also as a local application in SUDAMEN, or "PRICKLY HEAT," and in PRURITUS. The modus operandi of the drug in these affections has never been explained.

Diseases of the Mouth, Throat, etc.—From its agreeable taste citric acid enters into the composition of confections and lozenges, each mass containing two grains of the agent. Citrate of potash may take its place.

ACIDUM GALLICUM. Gallic Acid.

Like tannic acid, gallic acid is obtained from galls, and really is a product of the action of a ferment in the presence of water upon tannic acid, converting it into gallic acid. It is in delicate, shiny, acicular crystals, almost colorless. "It is inodorous, of a sourish, astringent taste, and of an acid reaction." (U. S. D.) "It is soluble in 100 parts of cold and three of boiling water, in four and five-tenths parts of alcohol, in one part of boiling alcohol, in three parts of absolute alcohol and 39 parts of absolute ether." (U. S. D.) A solution of 40 grains to the ounce in glycerin may be diluted by water without precipitation. Unlike tannic acid, it does not precipitate solution of gelatin. The only official preparation is the ointment (Unguentum Acidi Gallici), containing ten per cent. of gallic acid.

Gallic acid has the local properties of tannic acid; while a weaker astringent than it, it possesses the advantage of being less irritating.

General Surgery.—As a topical astringent application gallic acid is greatly inferior to tannic acid, as it does not coagulate albumin.

D. H. Agnew recommends equal parts of gallic acid and iodoform as a dusting application in the treatment of CHANCROIDS. This combination is especially useful when the sore has an indolent appearance and a tendency to sero-purulent discharge. Equal parts of the ointment of gallic acid and ointment of stramonium is one of the most serviceable topical applications for EXTERNAL PILES. In a great majority of cases this, in conjunction with either hot or cold water sitz-baths, twice daily, and the use of a mercurial, will relieve the patient in a short time. Agnew also advises the use of gallic acid and glycerin as a prophylactic in the treatment of delicate and TENDER NIPPLES, care being taken that the breast is thoroughly cleaned before nursing.

Diseases of the Throat.—Some writers believe that the addition of one-third gallic acid to two-thirds tannic acid in local treatment of the inflammations of the nose and throat, diminishes the irritative effects of the latter without lessening its astringent properties. Used in the form of a lozenge, each mass should contain two grains of the agent.

ACIDUM HYDROCHLORICUM. Hydrochloric Acid. Muriatic Acid.

"A liquid composed of thirty-one and nine-tenths of absolute hydrochloric acid and sixty-eight and one-tenth of water." (U. S. P.)

Absolute hydrochloric acid is a gas, and the official hydrochloric acid, as will be seen, contains approximately 32 per cent. of this gas dissolved in water. It is "a colorless, fuming liquid, of a pungent, suffocating odor, an intensely acid taste, and a strongly acid reaction." (U. S. P.) It emits white fumes when exposed to the air, owing to the escaping hydrochloric acid gas uniting either with the moisture of the atmosphere or with any ammonia that may be therein. Commercial hydrochloric acid is not fit even for external use, because of its impurity. Hydrochloric acid combines with all the alkalies, and most earths, with oxides and with carbonates, forming salts. It is incompatible with solutions of sulphide of potassium, nitrate of silver, and subacetate of lead. Dilute hydrochloric acid is official and is composed of six parts of hydrochloric acid mixed with 13 parts of water.

Hydrochloric acid is a mild escharotic and stimulant.

General Surgery.—Hydrochloric acid, though belonging to the group of strong acids, occupies but a small space compared with the other acids as a topical application. For caustic purposes it is practically useless, and consequently is never employed. It is, however, of great service for softening plaster-of-Paris bandages, so that they may be easily divided with an ordinary knife. It is usually applied with a glass pipette to the part that is to be cut through. In the absence of a pipette, a small swab of cotton on the end of a stick may be saturated with acid and drawn a few times over the surface of the bandages. In this way thick, heavy bandages may be readily separated with little effort.

Hydrochloric acid is of great service in the removal from the fingers and nails of the stains following the use of permanganate of potash. It is used in the preparation of sponges for surgical purposes. (See Spongia.) Andrews (*Kansas City Medical Record*, September, 1887,) advocates the Removal of Sequestra by injecting dilute hydrochloric acid through the cloaca, thus dissolving the dead bone. In Ostitis and Caries, Chassaignac advises the use of the acid for the Removal of the Crumbling Bone. It may be injected, or applied by means of a cotton swab. In Cystitis, when the urine is very alkaline, with a large amount of phosphatic deposits, as is often seen in cases of fracture of the vertebræ, injections of hydrochloric acid, from one-half to one minim to a fluid ounce of water is of service.

Diseases of the Ear, Nose and Throat.—Hydrochloric acid when employed pure is a caustic on mucous surfaces. As such it is employed in Noma and Putrid Sore Throat. Diluted with three parts of honey it constitutes one of the older applications for Diphtheria (Bretonneau). A stimulating gargle is formed by adding ten minims of the dilute acid and 24 minims of glycerin to an ounce of water. The teeth would be injured by prolonged use of such a preparation. Hydrochloric acid is but little employed in the throat or nose. It is a weak caustic—the eschar soon falling off.

ACIDUM HYDROCYANICUM DILUTUM. Diluted Hydrocyanic Acid. Prussic Acid.

"A liquid composed of two per cent. of absolute hydrocyanic acid and 98 per cent. of alcohol and water." (U. S. P.) "A colorless liquid, of a characteristic odor and taste resembling those of bitter almonds, and having a slightly acid reaction." (U. S. P.) It should be kept in well stopped bottles and not exposed to the light. The preparation known as Scheele's medicinal hydrocyanic acid is two and a half times as strong as the official diluted acid,—containing as it does five per cent. of absolute hydrocyanic acid.

Diseases of the Skin.—Hydrocyanic acid is employed as a sedative in URTICARIA, PRURITUS VULVÆ, ECZEMA and ERYTHEMA. It is commonly applied as a lotion in the proportion of half a drachm to a drachm of the diluted acid to the ounce of water. Its effect is uncertain and variable. Its chief advantage over other antipruritic sedative applications is in its agreeable odor. It should not be employed over an abraded surface, and hence should rarely be employed in eczema and only with some caution in pruritus vulvæ. In ERYTHEMA MULTIFORME, when itching is present, the hydrocyanic acid lotion is useful, and it often relieves the annoying symptoms of URTICARIA.

Cyanide of potassium is sometimes employed instead of hydrocyanic acid, in ointment of the strength of six grains to the ounce of cold cream, or in lotion of the strength of two grains to the ounce of water.

Diseases of the Throat.—Diluted in the strength of three drops of dilute hydrocyanic acid to a half pint of water at a temperature from 80° F. to 120° F., a preparation is obtained which is recommended by M. Mackenzie, Lefferts and Sajous as a potent sedative in the SPASMODIC IRRITATIVE COUGH in the first stage of PHTHISIS, as well as in attacks of ASTHMA and HAY FEVER. A few inhalations will often arrest a severe paroxysm.

ACIDUM LACTICUM. Lactic Acid.

Lactic acid of pharmacy is a "liquid composed of 75 per cent. of absolute lactic acid, and 25 per cent. of water. It is a nearly colorless, syrupy liquid, having an acid taste, and an acid reaction." (U. S. P.)

Lactic acid is a caustic to highly organized tissues and a solvent for horny epithelium. It also possesses mild antiseptic properties.

General Surgery.—Lactic acid was not much used as a topical application in surgery until Mosetig-Moorhof brought it into prominent notice as a slow destructive agent in the treatment of EPITHELIOMA, LUPUS and TUBERCULOUS ULCERATIONS. According to his statement we have in lactic acid, when applied locally, a slow caustic action, destroying only the diseased part and not affecting the healthy tissue, and resulting in a short time in the complete removal of all affected tissue. A great deal of evidence is brought to bear that these statements are not correct, and that lactic acid is equally destructive to healthy and diseased tissue.

Cheron (*Gaz. de Gynecol.*, February 1, 1888) recommends it in the treatment of VAGINAL ULCERATION that has resisted other means of treatment. It has been used in TUBERCULOUS ULCERATION OF THE TONGUE. Lactic acid, 80 parts; water, 20 parts, brushed daily over the ulcerated surface with a camel's hair brush. (*Rev. de Therap*, April 1, 1889.)

Diseases of the Skin.—Lactic acid in a pure concentrated form has been used successfully in the treatment of TYLOSIS. The fluid is well rubbed in by the aid of a brush of cotton or lint tied to a short stick. The effect of the application is to soften the overgrown epidermic masses, which easily peel off after a few days' treatment. The hypertrophy returns, but by persistence a cure eventually results, according to Knocke. (*Jour. Cut. and Ven. Dis.*, v, *1887, p. 122.*)

Lactic acid has also been used in VERRUCA, CHLOASMA and LENTIGO. In the case of the two latter the acid should be diluted with three parts of water.

In LUPUS VULGARIS lactic acid, applied pure or made into a paste with salicylic acid, has been employed with success. A piece of lint wet with the lactic acid, or a thin layer of the paste, is applied to the diseased part and then covered with gutta percha, the surrounding healthy tissue having been protected by ointments or gutta percha solution. After 24 hours the dressing is removed, the resulting ulcer dressed with iodoform gauze, and this dressing remains for 48 hours. Lactic acid is then once more applied and the procedure repeated.

Mosetig-Moorhof (*Cbl. f. Chir., 1885, p. 193*) appears to have been the first to find that concentrated lactic acid brought in contact with fungous granulations changed these into a soft blackish mass. Applied to LUPUS, EPITHELIOMA and FLAT PAPILLOMA, the entire tissue, stroma and all, became changed to a blackish mass. The acid is applied as above, pure or made into a paste with salicylic acid. The application is to be made at intervals of 12 hours.

Diseases of the Ear, Throat, and Nose.—To produce the caustic effect of lactic acid in the nose, mouth, and throat the agent must be used pure. Solutions of varying strengths are demanded in other clinical conditions. Victor Lange (*Archives of Otology*, vol. 17, No. 1) applies lactic acid, 15 to 30 per cent., with good results in CHRONIC SYPHILITIC CONDITIONS OF THE MIDDLE EAR. It corrects odor and diminishes the discharge. C. Astier (*Rev. Gen. Clinique et de Therap.*, February 7, 1899) recommends lactic acid for HYPERTROPHY OF THE NASAL MUCOUS MEMBRANE. The author employs two parts of the acid to one of water. Jellinek (*Centralblatt f. Laryngologie*, 1886) finds the acid available for small, recent, SHALLOW ULCERS and SOFT INFILTRATIONS, also in GRANULAR PHARYNGITIS, ATROPHIC and HYPERTROPHIC CATARRH. Rafin uses an eighty per cent. solution of lactic acid in the local treatment of LUPUS in the nasal passage. Cartaz recommends it in the treatment of NASAL TUBERCULOSIS. In NASAL DIPHTHERIA a spray of a drachm of the acid to the ounce of water is spoken of highly by M. Mackenzie. In the more usual pharyngeal form of this disease a weaker preparation will suffice, viz., a strength of twenty minims to the ounce of water. If the child does not permit spraying, the preparation may be used as a pigment. Reports vary as to the value of lactic acid in TUBERCULOUS ULCERATION of the tongue. Poncet (*Lyons Médical*, January, 1887) found it to be painful, while it proved to be futile, in his attempts to heal the ulcer. On the other hand, Rafin (*Ibid.*, July 8, 1888) extols its use. Applications made twice daily for six weeks resulted in a cure. A solution of a strength of eighty per cent. was employed.

H. Krause (*Berliner klin. Wochenschrift*, 1885, 462) called attention to this drug as a local remedy for LARYNGEAL PHTHISIS. He was led to make a trial from its known value in the treatment of LUPUS. It is now by most observers accepted as one of the best of topical applications in the condition named. J. Sedziak (*Journal of Laryngology and Rhinology*, 1889, 232) claims in 73.3 per cent. more or less favorable effects, follow its use. The cases in which failure was noted were those which had been under observation but a short time, or in which there had been extensive complications prohibiting the free use of the acid. Even in the most unfavorable circumstances he states that the applications facilitate deglutition. The acid is used in strengths varying from ten to one hundred per cent. It is well to begin with a weak solution and gradually increase its strength, since it is known that in some cases irritations of a high grade may follow if a sound mucous membrane be involved in an application. The solution is usually applied by the brush. A sensation of burning may ensue which may have a duration of several hours; this in a measure is assuaged by the subsequent applications of cocaine, of ten or fifteen or twenty per cent. If much hardened infiltration be present, it is well to precede the application by scarification or curetting. On soft infiltration lactic acid acts more quickly than on the hard, and with especial rapidity upon ulcerated surfaces; it appears to be thus applicable in ULCERS which exist on the vocal cords. Dysphagia is almost always diminished and sometimes ceases. The applications are recommended to be made every second day at first, but subsequently every day. Laryngeal spasm can be overcome by an application of cocaine, from ten to twenty per cent. Since the effect of cocaine upon laryngeal structures is transient, the acid should be used soon after the analgesia is developed. If ulceration be present, the acid should be rubbed on the ulcerated places thoroughly. The action of the lactic acid on secretions in which blood enters is to color them brown. It is not easy to make applications of lactic acid on the epiglottis, and it is probably due to this that affections of the epiglottis are more or less resistant to the acid. Before making applications, the parts should be cleansed and all masses of tenacious mucus removed.

Hering was the first to employ the acid by parenchymatous injections. He especially indicates its use in the case of mushroom growths on the posterior region; also, in cases of recent extensive INFILTRATION OF THE EPIGLOTTIS. Krause injected under the mucous membrane a solution of 30 per cent. to the amount of three to five drops, but subsequently, owing to the inflammatory action of the acid, he diminished it to 10 per cent. G. Major, of Montreal, prefers a 20 to 30 per cent. solution, 15 to 20 minims of which are injected at each sitting. He employs it with advantage in a case of primary tubercular deposit; it proves to be almost painless, the swelling disappearing in about three days. Cure is not to be expected, but the arrest of the process is sometimes accomplished, and if used before perichondritis sets in, the patient can be made comfortable. C. H. Knight (*Jour. Amer. Med. Ass'n*, 1890, 90) applies a 50 per cent. solution of lactic acid in LARYNGEAL PHTHISIS, and gradually increases from this strength up to applications of one hundred per cent. While laryngeal ulcers of tubercular origin are cured by this agent, Knight holds that the pulmonary conditions remaining unrelieved are liable to cause relapse.

In inhalation, lactic acid is employed in solution of one-half to two per cent.

ACIDUM NITRICUM. Nitric Acid.

" A liquid composed of $69\frac{4}{10}$ per cent. of absolute nitric acid and $30\frac{6}{10}$ per cent. of water." (U. S. P.) Nitric acid has the specific gravity of 1.420, and should be colorless. If it is sufficiently concentrated it emits white fumes on exposure to the air. Diluted nitric acid is official, and is one part of nitric acid mixed with six parts of water.

Nitric acid is a caustic and stimulant.

General Surgery.—Strong nitric acid, when applied to any living organism, acts as a powerful caustic and escharotic. It communicates a permanent yellow stain to the cuticle. Owing to its chemical activity, nitric acid fumes were used at one time as a disinfectant, but they have long since been superseded by more active and reliable agents.

Nitric acid is more extensively used as an escharotic than any other of the mineral acids, its action being easily controlled. It is best applied with a small glass rod or splinter of wood (which may be wrapped with cotton if a more liberal use of the drug is desired), or—what will be found convenient—with a twig taken from a broom. Its caustic action is easily stopped by covering the cauterized surface with sweet oil. In HOSPITAL GANGRENE and PHAGEDENIC ULCERATION, nitric acid has long been held in high repute. In treatment of hospital gangrene it is important that the sloughs should be thoroughly broken up (as by introducing the blades of a pair of dressing forceps, closed and then opening them), so that the acid may find its way through the sloughing mass down to healthy tissue. By this method much prompter and better results will be obtained than if the acid is applied only to the surfaces of the sloughs.

Nitric acid has long been employed, as first recommended by Wellbank, in the treatment of PHAGEDENIC ULCERATION, especially of a venereal character. In this method of treatment it is important that the ulcerated surface be thoroughly cleansed and dried, and the surrounding parts protected by a thick coating of cosmoline or oil, to prevent the acid from coming in contact with them, after which a small swab of cotton, fastened to a splinter of wood, is saturated with the acid and carefully pressed into every portion of the ulcer. After permitting it to remain upon the tissues for half a minute, during which time the pain is severe, its action may be quickly stopped by applying a pledget of cotton saturated with sweet oil. After this a cold water dressing may be applied. In the removal of VENEREAL WARTS, we are in the habit of quickly snipping them off with a pair of scissors, and then touching their bases with a drop of nitric acid. This mode of treatment is prompt, efficient, and not very painful.

In CHRONIC CYSTITIS, especially when the urine is very ammoniacal, the injection of one or two drops of nitric acid, diluted with an ounce of water, very slowly thrown into the bladder, was first proposed by Benjamin Brodie, and is still commended by Sir Henry Thompson. After the bladder has been washed out twice the nitric acid and water (a slightly acidulated solution, containing a small portion of morphine) should be injected and retained as long as possible. Should hemorrhage occur, tannic acid may be substituted for the nitric acid.

Nitric acid is sometimes employed for the removal of HEMORRHOIDS; but is suitable only for the small strawberry piles containing a number of vascular twigs which bleed freely on the slightest irritation. Such piles may be exposed with the speculum, touched with acid, and then

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covered with sweet oil. The removal of other forms of hemorrhoidal tumors can be effected best by means of the ligature or clamp.

Nitric acid is a useful application in the treatment of PROLAPSE OF THE RECTUM, and is recommended for this purpose by Cripps, Agnew, Kelsey, and Allingham. It is, however, of little service except in the case of children. The action of nitric acid on the prolapsed rectum can be well understood if we recall the way in which prolapse generally begins. The mucous coat is attached to the muscular coat by loose, connective tissue, so that there is considerable mobility of the one coat upon the other. Partial prolapse is the result of the gradual stretching of the submucous tissue. In complete prolapse, after the mucous coat has slid as far as possible, it drags upon the muscular coat and produces eversion of the bowel. The action of the nitric acid is to create inflammation with resulting exudate into the loose connective tissue, and the formation of new contractile, fibrous material, which binds the two coats firmly together.

The application of nitric acid for prolapse of the rectum is made by first carefully cleaning the bowel and then applying fuming nitric acid freely over the mucous membrane, care being taken to avoid the skin. The bowel should then be greased and returned, and a pad placed over the anus.

Nitric acid is recommended by Thomas as an efficient caustic in cases of CANCER OF THE CERVIX UTERI, which are not subjected to surgical operation. The acid is applied thoroughly to the whole diseased surface, and a pad of cotton saturated with glycerin is placed over it. This application produces a decided slough and destroys many of the blood-vessels which have proved the sources of hemorrhage. Thomas states that such an application should be repeated once in every two or three months.

Nitric acid has been employed by Atthill, Goodell, and others with advantage in cases of FUNGOID GRANULATION and EXCESSIVE HEMORRHAGE OF THE UTERUS. It is introduced by means of cotton on the applicator.

In CANCER OF THE UTERUS, West speaks highly of a lotion of nitric acid, a drachm to the pint of water, to check profuse discharge.

Diseases of the Skin.—The strong nitric acid of the Pharmacopœia is used as a caustic in some diseases of the skin. It deoxidizes the tissues, depriving them also of water and leaving a dry, charred eschar. It is employed in the destruction of EPITHELIOMA, VERUCCA, NÆVI, and other new growths. The acid is best applied by means of a pointed splinter of wood, the excess being carefully wiped off with cotton. In destroying warts care must be taken not to allow the action to go too far, or a slough with consequent cicatrix may result. Likewise hemorrhage may follow on the separation of the slough when nævi have been destroyed by nitric acid, so that it is not desirable to use it in extensive growths of this kind.

Diluted nitric acid may be employed for the removal of CHLOASMA. It must be used, however, with some caution. The object is simply to cause such exfoliation of the skin as may suffice to remove the pigmentary matter. If the action goes a little deeper, a slough with resulting cicatrix may ensue.

Nitric acid, pure or slightly diluted, may be employed for the removal of PIGMENTARY NÆVI or small MOLES. In this affection it is scarcely possible to remove the disease entirely without producing a cicatrix, and the patient should be forewarned of this probable result.

Diluted nitric acid is employed as a lotion in PRURITUS. Liveing suggests the following formula: ℞. Acid nitric. dilut., f℥iij; Tinct. opii, f℥ij; Aquæ, ad Oj. M. As a lotion to ULCERS, it is employed in the strength of twelve minims to the pint of water. Nitric acid is also employed in baths (see BATHS).

Diseases of the Ear, Throat, and Nose.—The topical action of nitric acid in the throat, mouth, and nose is, in the main, confined to its caustic effect., To secure this, the undiluted acid must be selected. It is more diffusible than any other acid which is used for caustic purposes. It resembles acetic acid and chromic acid in the character of the eschar produced, but its application excites more pain than does either of these agents. It may supplant them in the destruction of hypertrophied nasal mucous membrane. The degree of diffusibility of nitric acid renders it unfit for use in the destruction of AURAL POLYPUS, while presenting some advantages over agents, whose actions are more limited, in endeavoring to cover the sinuous surface of a PHAGEDENIC ULCER with a protectant eschar. Hence, it is frequently used in the local treatment of NOMA and PUTRID SORE THROAT. The pure acid is carried on the end of a match or glass rod and rubbed firmly into the parts. Roosa states that he has succeeded in removing CERUMEN by the use of fuming nitric acid, after having failed with both alkaline solution and oils. Since the introduction of peroxide of hydrogen this remedy should be discarded. S. Hartwell Chapman believes that nitric acid can be employed in the same indications as chromic acid for the destruction of growths in the nasal chamber, and in the treatment of CHRONIC CATARRH accompanied with free discharge.

ACIDUM OXY-NAPHTHOICUM (Alpha).

"White, inodorous, micro-crystalline powder; soluble in 30,000 parts of cold water; more readily soluble in aqueous solutions of the bicarbonates or of ammonium, which then enter into combination with it. More readily soluble in alcohol, chloroform, benzol, and oils, both fixed and volatile." (*Merck's Bulletin.*)

Oxy-naphthoic acid is obtained in combination with sodium by heating α-naphthol-sodium with carbonic acid, and is related to α-naphthol as salicylic acid is to phenol. It is irritating to the nasal passages.

It has marked antizymotic properties, and is said to be five times stronger than salicylic acid. It is not used internally.

This remedy has not as yet been generally taken up by physicians, and with regard to it, as to other remedies, substitutes for iodoform, etc., recently introduced by distinguished German observers, it must be remembered that these are proprietary preparations, and that (the distinguished German physicians) frequently have some pecuniary interest in their manufacture. All such preparations must, therefore, be received with caution.

A similar preparation has been made from β-naphthol, β-naphthoic acid.

Diseases of the Skin.—Oxy-naphthoic acid was introduced by Schwimmer (*Wien. Med. Wochenschr.*, Nos. 3 to 5, 1890) as a remedy in SCABIES, PARASITIC SKIN DISEASES, and PRURIGO.

The formula recommended in scabies is: ℞. Acidi oxy-naphthoici, Pulv. cretæ, Saponis viridis, āā ℈iv, Adipis, ad ℥j. M.

This preparation is not irritating to the skin, and in no way toxic. It can be used upon children. Although the drug rapidly reaches the circulation and is excreted in the urine, Schwimmer has never observed renal irritation.

In SCABIES the acid is said to kill the acarus in three or four days, but the eczema accompanying the disease requires further treatment.

A similar ointment made with adeps alone has been employed by Schwimmer successfully in PRURIGO.

ACIDUM PHOSPHORICUM. Phosphoric Acid.

Phosphoric acid is defined in the U. S. P. as "a liquid composed of 50 per cent. of ortho-phosphoric acid and 50 per cent. of water." There was formerly official in the U. S. P. a solid phosphoric acid which was called "*Glacial Phosphoric Acid.*" It is metaphosphoric acid, HPO_3, and is gradually changed to the ortho-variety when dissolved in water. This change is hastened by the application of heat. Because of its constant impurities it has been dropped, and the present 50 per cent. solution, which for several years had been known and sold as "*Syrupy Phosphoric Acid*," has been made official. Phosphoric acid is a "colorless liquid, without odor, of a strongly acid taste and reaction. Specific gravity 1.347." (U. S. P.). *Glacial Phosphoric Acid* "is a white, uncrystallizable, fusible solid, inodorous, very sour to the taste, slowly deliquescent, slowly soluble in water; soluble also in alcohol." (U. S. D.) It is $88\frac{8}{10}$ per cent. of phosphoric oxide combined with $11\frac{2}{10}$ per cent. of water. Diluted phosphoric acid is an aqueous solution of phosphoric acid in water, containing 20 per cent. of the official phosphoric acid (equivalent to 10 per cent. of ortho-phosphoric acid).

Diseases of the Skin.—A solution of 50 grains phosphoric acid to the ounce of distilled water has been used by Grossich in the treatment of Ulcers. The ulcer is covered with lint dipped into this solution, and the dressing is renewed three or four times a day. The treatment is said to be peculiarly successful in Scrofulous Ulcers. Grossich also injects a hypodermic syringeful of the same solution into Tuberculous Glands of the neck, which, he says, become reduced in size within 24 hours.

A diluted solution of phosphoric acid has been recommended in the treatment of Eczema of the Lips. It should be employed with great caution. Its effect is the same as that of other stimulants; in strong solution it is caustic, or nearly so.

ACIDUM PYROGALLICUM. Pyrogallic Acid. Pyrogallol.

An acid obtained by the decomposition of gallic or tannic acid by heat. "It is in white, shiny scales, inodorous, very bitter, soluble in two and one-fourth parts of water, and readily dissolved by alcohol and ether." (U. S. D.)

Pyrogallic acid is caustic and parasiticide. It, however, cannot be employed with impunity over large surfaces, as absorption may take place with poisonous effect.

General Surgery.—Pyrogallic acid is not unlike chrysarobin in its action. It seems to have a good effect in promoting Cicatrization and Contraction of Ulcers. If the area is large, only a small portion should be treated at a time. M. Vidal has announced that pyrogallic acid is an excellent application to Chancroids, especially if there is a tendency to phagedenic action. It may be applied in alcoholic solution, or in ointment made with cosmoline, in strengths varying from ten per cent. to an equal part. The solution may be applied by saturating a pledget of absorbent cotton.

Diseases of the Skin.—Pyrogallic acid was originally introduced by Jarisch (*Wien Med. Wochensch.*, 44 and 45, 1878) as a substitute for chrysarobin in the treatment of Psoriasis. An ointment of 100 grains to the ounce will sometimes produce, it is said, a deep caustic effect; we frequently, however, use 60 grains to the ounce without the slightest untoward result. In the strength of a drachm to the ounce it stains the skin a dirty brown color and gives it a leathery appearance. The epidermis exfoliates in a week or two. It can be applied without pain to excoriated spots and causes no inflammation of the surrounding skin. Its action upon the lesions of psoriasis is less rapid than that of chrysarobin, but it is quite as efficient. It whitens the diseased patches and leaves a brownish or blackish stain round them.

Pyrogallic acid is employed in powder or in strong ointment (ʒj–ij ad

℥j) as a caustic in the treatment of Epithelioma. The crusts or horny epithelium covering the diseased patch having been removed by scraping or the application of caustic potassa, the ointment is applied, spread upon a rag cut out somewhat smaller than the area to be operated upon, and secured firmly to its place. This is renewed daily, the débris being scraped away. The pyrogallic acid seems to have a selective affinity for the diseased tissue. Its effect should be watched and not allowed to go too far. A number of applications are usually necessary, but the caustic is almost or entirely painless.

In the Vegetable Parasitic Diseases, particularly in Parasitic Sycosis, an ointment of 20 to 30 grains to the ounce is very effective.

Pyrogallic acid has been used in the treatment of Lupus Vulgaris, in the form of ointment, one drachm to the ounce. Also in the treatment of Phagedenic Ulcers. These are first scraped and then an ointment of one hundred grains to the ounce is applied.

ACIDUM SALICYLICUM. Salicylic Acid.

"A crystalline acid obtained by the combination of the elements of carbolic acid with those of carbonic acid gas, and subsequent purification, or from natural salicylates, such as the oils of wintergreen and sweet birch." (Ph. Br.)

The first process spoken of was patented in all countries by Prof. Kolbe, its discoverer, and is practically the only process used, as obtained in any other way its cost is several times greater than it is by this method. The patent has recently expired in this country. Salicylic acid, when pure, is in "fine, white, light, prismatic, needle-shaped crystals, permanent in the air, free from odor of carbolic acid, but sometimes having a slight aromatic odor, of a sweetish and slightly acid taste, and an acid reaction." (U. S. P.) "It is soluble in 450 parts of water and two and a half parts of alcohol; in 14 parts of boiling water; very soluble in boiling alcohol; also soluble in two parts of ether, two parts of absolute alcohol, and in 80 parts of chloroform." (U. S. P.) A ten per cent. alcoholic solution may be diluted with water without precipitation. It is much more soluble in solutions of some neutral salts than it is in water; for instance, in solution of citrate of ammonium, phosphate of sodium, nitrate of potassium, and sulphate of sodium. It unites with bases to form salts of which the salicylate of sodium is the best known. Salicylates of the alkaloids are recommended for hypodermic use, with the theory that the combined salicylic acid will prevent decomposition of the solutions. Its power of preventing decomposition and fermentation is well known. An ointment of salicylic acid is official in the Ph. Br., containing one part of the acid in twenty-eight of the ointment.

The salicylic acid prepared from the natural oils of wintergreen and sweet birch, has a slightly higher melting point than that prepared synthetically by Kolbe's process, and is as a rule much purer. It is, therefore, almost devoid of the unpleasant effects that follow the administration of the ordinary acid, no matter how much the latter may be purified by dialysis or other means.

A salicylated cotton (Thiersch's) is prepared by steeping absorbent cotton in a solution of salicylic acid. The proportion of acid in the solution is not fixed, and may vary from three to ten per cent.

Salicylic acid is antiseptic and a parasiticide. It possesses a peculiar property in softening epidermis. It is also mentioned as having astringent properties, but probably on insufficient grounds.

General Surgery.—Salicylic acid has long been known, but only of late years has it come into general use in surgery as a topical application. Kolbe found that a 0.04 per cent. solution had considerable influence in preventing milk from souring. Bucholz states that a 0.15 per cent. solution is sufficient to prevent the development of bacteria in ordinary organic mixtures; 0.3 to 0.4 per cent. destroys bacteria in vigorous growths. (Wood, p. 620.) The salicylate of sodium is about equal in efficiency to the pure acid.

Dr. Miller found that one per cent. of salicylic acid was sufficient to check the action of ptyaline on starch; while ten per cent. of carbolic acid was required to produce the same effect. There appears to be little doubt that salicylic acid is largely used as a preservative of fresh meat during the heated seasons, especially the so-called "western meat."

Mr. Callander, after a year's trial of salicylic acid in the wards of St. Bartholomew's Hospital, abandoned it, as much inferior to carbolic acid.

The following solutions were used at St. Bartholomew's Hospital: Phosphate of sodium, 3 parts; Salicylic acid, 1 part; Water, 50 parts. Salicylic acid, 1 part; Olive oil, 49 parts. Salicylic acid, 1 part; Bicarbonate of sodium, ½ part; Water, 100 parts. Salicylic acid, 10 parts; Borax, 18 parts; Water, 100 parts. A 25 per cent. solution which will bear dilution with water may be prepared.

℞. Acidi salicylic., ʒij; Sodii biborat., ʒj; Glycerini, q. s. Mix the acid and borax, then add glycerin to one fluidounce with four drachms of glycerin, and heat gently until dissolved. (Wood, Ed. 8, p. 639.)

An ointment of salicylic acid, in the strength of one-half to one drachm in one ounce of cosmoline may be employed with most satisfactory results in the treatment of ERYSIPELAS. The ointment is applied, spread on lint, and the part is enveloped in raw cotton. Watson Cheyne employs a cream composed of salicylic acid, 2 parts; carbolic acid, 1 part; glycerin, 10 parts, to be smeared over superficial WOUNDS and ABRASIONS. In the treatment of CHANCROID, salicylic acid has been extensively employed. Angloda speaks of it in the highest terms. After the ulcer is thoroughly cleansed with an antiseptic solution, the powdered acid should be thoroughly dusted over its surface.

H. Von Hebra (*Annals de Derm. et de Syph.*, May, 1890) does not regard the use of salicylic acid for the treatment of CHANCROIDS so favorably, stating that the acid produced too much irritation when dusted over their surfaces, and when used in ointment the healing is slow, and it is no better than iodoform, the formation of bubo being just as frequent. Dr. Cheron recommends the following as a very efficient injection in deodorizing the fetor of Uterine Cancer. ℞. Acidi salicylic., gr. ij; Sodii salicylat., gr. xl; Tinct. eucalyp., fʒiss; Acid. aceti, f℥iss; to be added to two pints of water and used as a douche every four hours.

Salicylic acid may be employed with advantage in the treatment of Uterine Cancer, to correct the fetor. It is used by means of a cotton tampon thoroughly impregnated with the drug, which is changed twice daily. In conjunction with this a vaginal douche of a three per cent. solution of creolin should be used.

Salicylic acid has been employed by injection for the removal of Ascarides. ℞. Acid. salicylic., ʒss; Sodii bicarb., ʒss; Aquæ, Oj. To be thrown into the bowel. An enema should be first given, cleansing the bowel of all fecal matter, and then the solution just described should be used. It is also used as an injection in Dysenteric Diarrhœa in children, in the proportion of 1 part to 300.

Diseases of the Skin.—The employment of salicylic acid as an external agent in the treatment of skin diseases dates from about 1875, when it was recommended for Moist Eczema of the scalp and face. Lassar (*Monatschrift f. Prakt. Dermatol.*, 1883, p. 97) recommended its use in paste as well as ointments in Eczema Rubrum and in Impetigo Contagiosa of children. It has also been employed successfully in Psoriasis, Lupus and Parasitic Affections. Salicylic acid has been employed also to prevent the extension of Erysipelas.

The action of salicylic acid in the softening and removal of excessive epidermic growths and in favoring the normal proliferation of epithelium has been made the subject of investigation by several dermatologists, notably Unna (*Monatschrift f. Prakt. Dermatol.*, 1882, No. 4).

In the treatment of Favus, epilation, followed by the inunction of a solution of 10 to 25 grains of salicylic acid in an ounce of castor oil, has been found effectual.

In Tinea Tonsurans and Tinea Circinata, as well as in Tinea Versicolor, an alcoholic solution of salicylic acid, of 40 to 50 grains to the ounce, painted on, has been highly recommended. A similar solution in liquor gutta percha may be used on non-hairy parts of the body.

In Pityriasis of the scalp and in Squamous Eczema (Eczema Seborrhœicum of the face) an ointment of 20 grains of salicylic acid in an ounce of ichthyol has been used to advantage. A combination of salicylic acid with sulphur, in the proportion of 20 to 40 grains of the former and a drachm of the latter in an ounce of vaseline, we have found equally advantageous in similar cases.

Mixed with starch, oxide or carbonate of zinc and other powders, as in the following formula, salicylic acid forms an excellent application in the treatment of Hyperidrosis. ℞. Acid. salicylic., ʒij; Zinc. carb. precip., ʒiv; Magnesii ustæ, ʒiv, Lycopodii ℥iss. M.

In the treatment of some forms of Subacute and Chronic Eczema, particularly about the face and scalp, or elsewhere when there is an abundant purulent discharge with decomposition, the milder ointments of salicylic acid, alone or combined with mild astringents, are found of the greatest service in checking the discharge and in keeping the parts from becoming foul-smelling. The following formulæ may be suggested: ℞. Acid. salicylic., grs., x-xx ; Vaselini, ℥j. M. ℞. Acid. salicylic., grs. x–xx ; Pulv. zinci oxidi, ʒss–ʒj ; Adipis, ℥j. M.

P. Szadek (*International Klin. Rundschau,* June 7, 1889) recommends a plaster of 15 grains of salicylic acid to the ounce of soap plaster, in Chronic Infiltrated Eczema of the Extremities. He recommends a similar plaster, or an alcoholic solution of 40 or 50 grains to the ounce in Psoriasis. We prefer an ointment of half a drachm to a drachm to the ounce, but do not consider this preparation equal to chrysarobin or pyrogallic acid as a local application in this disease.

A solution of one drachm salicylic acid, four drachms glycerin and an ounce and a half of alcohol has been employed successfully in the treatment of Lichen Planus.

In Non-parasitic Sycosis (or Coccogenic Sycosis) an ointment of a drachm of salicylic acid to the ounce of lard, has been employed by Heitzmann with marked success.

In Acne Heitzmann uses the following ointment: ℞. Acid Salicylic., gr. v ; Sulphuris precipitat., ʒss–℈j ; Adipis, ℥j. M. An alcoholic solution of 15 grains to the ounce, diluted considerably at first, softens Comedones and aids in their removal.

In Pruritus, particularly of the anus, a lotion of three to five grains to the ounce gives relief in some cases.

The most remarkable action of salicylic acid is, however, upon the epidermis and epithelium. It softens and loosens thickened masses of epidermis in an extraordinary manner, leaving behind a raw but not inflamed surface. It is therefore peculiarly useful in the treatment of Indurated Eczema, especially of the Palm and Sole, and also in the treatment of Tylosis, Verruca, Callositas, etc. In these conditions the "*india-rubber dermal plasters*" manufactured in this country are equal, in most cases, to those especially manufactured under Unna's supervision. A piece of salicylated rubber plaster applied to the skin over a Wart or Corn soon adheres and may be kept in contact for several days, when it may be removed, the softened epidermis scraped and fresh applications made as long as is necessary.

When the India-rubber plasters cannot be procured, the following preparation will serve a similar purpose: ℞. Acid. salicylic., ʒiij ; Creasoti, ʒvj ; Ceræ et adipis, āā q. s. The wax and lard are only added in sufficient quantity to give consistency to the mixture. The addition of creasote aids materially in the curative effect of the plaster, especially in ECZEMA.

In the treatment of small WARTS and CORNS, the following procedure is very effectual: The part is moistened with an antiseptic solution, covered with a thick layer of powdered salicylic acid, and over this is placed several thicknesses of the finest borated lint, bound down with gutta percha or some convenient bandage. The dressing is not removed for four or five days. It can then be renewed if the growth has not been destroyed.

Diseases of the Ear, Nose, and Throat.—Merck's dialyzed acid is said to be the most agreeable to the palate and the least irritating to the tissues. A three per cent. solution in alcohol is an admirable application in ASPERGILLUS of the outer auditory meatus. Salicylic acid is recommended by H. McNaughton Jones (*Lancet*, II, 1890) as a wash in the strength of three grains to the ounce of warm water for OTORRHEA associated with recent perforations in the tympanic membrane, and is held by this writer in preference to carbolic acid. In the form of a powder one part may be added to three parts of boric acid. J. McMunn (*Brit. Med. Journal*, Dec. 14, 1889) combines salicylic acid with tannic acid and subnitrate of bismuth as a snuff for ACUTE CORYZA, in proportion of about three grains to the drachm. The agent may, however, be mixed with one or more parts of some indifferent material, such as starch, and insufflated in CHRONIC NASAL CATARRH. It is especially useful in cases in which fetor is present.

In INFLAMMATION OF THE FAUCES, salicylic acid is of especial value in cases in which the exudate on the gland is of a character which makes it probable that a diphtheritic element is present, since the agent is also of use in removing the membrane in DIPHTHERIA. Haberkorn applies the pure powder to the surface of the tonsil. Gonsalez places salicylic acid in the first rank as a local medicament in the nasal form of the disease. The agent can be used in solution as a wash, for either the throat or the teeth. The acid is more irritant to the tissues than boric acid. In naso-pharyngeal catarrh a lotion of salicylic acid, from one to two grains to the ounce, is serviceable. It can be exhibited in combination with bicarbonate of sodium in the form of a gargle. Each lozenge and nasal bougie contains, as a rule, one grain of the acid. Salicylic acid is said by G. P. Field (*Year Book of Treatment*, 1885) to take the place of boric acid in correction of ear discharges.

It is useful in FETOR OF THE BREATH, in the proportions of five grains to the ounce of warm water. A similar preparation corrects offensive expectoration, especially in PHTHISIS. Barthold recommends it in CATARRHAL STOMATITIS and in THRUSH. This author claims the acid to be anæsthetic in stomatitis, calming the gnawing and burning pain after rupture of the vesicles. The solution he recommends is one part of the acid dissolved in alcohol to 250 parts of water.

Diseases of the Eye.—Salicylic acid has not been extensively used in ophthalmic surgery. Its solubility is said to be greatly increased by the addition of a neutral salt. A solution of five per cent. of salicylic acid and five per cent. of borax has been recommended as an antiseptic application for the eye. If this were really a solution of salicylic acid, 25 grains to the ounce would probably be much stronger than the eye could bear; but chemical tests made by Dr. Zimmerman, resident surgeon of the Wills Hospital, show that it contains very little, if any, of this acid, but is simply a solution of salicylate of sodium and boric acid. As salicylate of sodium is not an antiseptic, whatever virtue the preparation may have must be attributed only to the presence of boric acid.

ACIDUM SULPHURICUM. Sulphuric Acid.

The U. S. P. defines it as "a liquid composed of not less than 96 per cent. of absolute sulphuric acid, and not more than four per cent. of water," and describes it as "a colorless liquid, of an oily appearance, inodorous, strongly caustic and corrosive, and having a strongly acid reaction." Diluted sulphuric acid is official and is made by diluting one part of sulphuric acid with nine parts of water.

Sulphuric acid is a powerful corrosive of animal and vegetable tissues, abstracting the watery elements and leaving the carbon untouched. Diluted sulphuric acid, when applied to granulating or bleeding surfaces, acts as an astringent.

According to Squibb, the local effect of sulphuric acid in the form of a caustic is continuous and injuriously irritant. Its effects are more prolonged than are those of almost any other caustic; the irritation often persists through the process of sloughing.

General Surgery.—The acid has been recommended as an application in CARIES, as a solvent to the lime salts in the diseased bone, and as a cautery. The effect is to remove products of diseased action and invite the parts to create a surface which is disposed to heal.

The strong acid, owing to its affinity for water, is seldom used as an escharotic alone. Combined with powdered charcoal, forming a paste, it was at one time a favorite caustic application with D. Hayes Agnew in the treatment of CHANCRE, being retained in position by means of adhesive plaster.

Owen Pritchard (*Lancet*, October 25, 1890) speaks highly of it as superior to all escharotics for the destruction of CANCEROUS GROWTHS, especially in the class of patients where operative interference is not advisable, or for persons who refuse to submit to a cutting operation. *Michel's paste* is made by taking one part by weight of an indifferent excipient and three parts by weight of strong sulphuric acid (fuming) and mixing together on a glass slab, forming a paste. Pritchard claims that this mixture will accomplish as much in an hour as any other escharotic will in a week. When properly applied, it will completely destroy the largest TUMORS OF THE BREAST in from eight to ten hours. On the evening previous to the application, a blister is applied, removing all the epidermis, after which cocaine, not to exceed a grain and a half is applied. At the same time a hypodermic injection of morphine is given. After the cocaine has taken effect, a cake of the paste an inch thick and of sufficient size to cover the tumor, is applied. If these precautions are pursued, no pain is experienced. As soon as the tumor is destroyed, the cavity is cleaned out and filled with asbestos, covered with zinc ointment. It usually takes ten or twelve days for the eschar to separate, and during the latter part of the time the wound should be syringed twice daily with some disinfecting solution. Care must be exercised in applying the paste, to place the patient in a perfectly level position; otherwise the acid will gravitate to the lower side, and a portion of the growth will not be destroyed. The surrounding skin must be protected by collodion. Any fluid oozing from the part must be carefully removed with a piece of blotting paper or cotton.

In CARIES and OSTITIS involving the head of the tibia and other bones, Mr. Pollock advises the use of sulphuric acid, wiped through the cavity by means of a swab made of cotton on the end of an aluminum applicator. In SYPHILITIC CARIES, especially of the skull, where exfoliation is slow, Mansel Moullin advises the use of strong sulphuric acid as a means of hastening the separation of the diseased bone. In the BITES of RABID ANIMALS, W. Frazer regards the strong acid as one of the best of caustics that can be employed.

In RHEUMATISM and CHRONIC JOINT AFFECTIONS, an ointment composed of a fluid drachm of sulphuric acid to an ounce of lard, is said to have given great benefit.

Diseases of the Ear, Nose and Throat.—Elixir of vitriol has been used as a caustic on ENLARGED TONSIL. Six parts of sulphuric acid and four parts of diluted spirits has been recommended by Kohls for EPISTAXIS.

ACIDUM SULPHUROSUM. Sulphurous acid.

Sulphurous acid is "a liquid composed of about three and a half per cent. of sulphurous acid gas (sulphurous oxide), and about 96½ per cent. of water." (U. S. P.) Sulphurous oxide is "an irrespirable gas of a suffocating odor, familiar to every one as that of burning sulphur, which is converted into it by combustion." (U. S. D.) The official acid is decomposed with the formation of sulphuric acid by exposure to the air, or by exposure to sunlight, and consequently, should be freshly procured when desired. It unites with bases to form sulphites and bisulphites.

General Surgery.—Sulphurous acid as a topical application in surgery occupies but a small place, except for its germicidal properties when used in a gaseous state.

Vallin, one of the highest authority on disinfectants and disinfection, regards sulphurous acid, obtained by the combustion of sulphur in free air, as occupying almost the first place among veritable disinfectants; this statement being made ten years ago. The use of this agent has come down to us from the most remote ages; no other gaseous disinfectant is so extensively used. (See in this connection Sternberg's Report to American Public Health Association, p. 52.)

Thus, as can be seen, we have in sulphurous acid gas a cheap, reliable and easily applied disinfectant capable of destroying micro-organisms, but not their spores. As but few contagions contain spores, it is likely that sulphurous acid, when concentrated, is an efficient disinfectant if applied for sufficient time. Sternberg has proven by experiment that the gas acts much more freely when the air is loaded with moisture. In order to diffuse sulphurous acid through the air, it is well to secure a large iron pot, which is placed in the centre of the room upon a number of bricks, or, what is better still, in a tub containing from four to six inches of water, or in a box partially filled with wet ashes. When everything is in readiness the sulphur may be ignited after wetting with alcohol, or by dropping into the vessel a few live coals carried on a shovel from the kitchen range. In a few moments sulphurous acid gas is being rapidly evolved. The heat which is generated from the side of the pot vaporizes the water, and this keeps the air loaded with moisture all through the process. Should any of the molten sulphur boil over no harm will follow, as might happen if it fell on a board floor.

The acid may be employed in a saturated solution for the purpose of destroying germs in the excretions of the sick; but in corrosive sublimate we have a remedy so much more convenient and efficient, that it is seldom used for this purpose.

The so-called *sulphur cure*, brought so prominently forward by Dewar, consists mainly of varied applications of this acid. Thus in ERYSIPELAS he employs equal parts of sulphurous acid and glycerin, stating that it relieves the "burning" and arrests the spread of the inflammation. The same treatment, which he regards as much more efficient than that with carbolic acid, may be applied to WOUNDS and ULCERS.

Diseases of the Skin.—Sulphurous acid is occasionally employed in the local treatment of the VEGETABLE PARASITIC DISEASES.

In TINEA CIRCINATA, particularly in that variety known as BURMESE RINGWORM, where the affection chiefly attacks the groins and insides of the thighs, lotions of sulphurous acid are often useful.

Also in TINEA VERSICOLOR the lotion of sulphurous acid is an excellent remedy.

Diseases of the Ear, Nose and Throat.—In the strength as sold in the shops sulphurous acid is a reliable agent in the treatment of SYPHILITIC ULCERATIONS OF THE RESPIRATORY PASSAGES. The indications for its use are first that the bones be not involved; secondly, that œdematous inflammation of the surrounding parts be subdued. The pain attendant upon its free application is but slight and the affected parts may be mopped daily. It often acts like a charm on MUCOUS PATCHES. Slightly diluted it is of great value in MERCURIAL STOMATITIS. Placed in a sprayer which is put in connection with a compressed air cylinder, permitting the atomized liquid to be driven with force, the acid is efficacious in breaking up the detritus which accumulate on the tongue in many diseased states of the mouth and throat. Forty to sixty drops may be used at one treatment by spray. It holds a secondary position in the treatment of LARYNGEAL PHTHISIS, though spoken of highly by Bassols and J. Solis Cohen. To make a weak impression it may be exhibited in lemonade as a gargle. H. McN. Jones employs a two per cent. solution as an injection in CHRONIC NASAL CATARRH. F. E. Hitchcock (*Phila. Med. Times*, May 21, 1881) recommends that equal parts of sulphurous acid and water be used in form of a spray in DIPHTHERIA. This preparation may be also used as a gargle.

Fresh preparations of the acid are highly pungent, and the patient should be warned not to take deep inhalations during the treatments.

Inhalations of sulphurous acid are, however, recommended for a variety of conditions, in the main inflammatory, of the respiratory tract. Among these may be named CATARRHAL PHARYNGITIS and CHRONIC BRONCHITIS. It holds a questionable position in the treatment of APHONIA.

ACIDUM TANNICUM. Tannic Acid. Tannin.

Tannic acid is a glucoside obtained from many vegetable astringents. The official tannic acid of both the U. S. P., and Ph. Br. is made from galls, and is distinguished from that occurring in leaves, barks, etc., by the name of Gallotannic Acid, while the others take the name of the source from which they are derived, as Quercitannic Acid, from oak bark. "Tannic acid is solid, uncrystallizable, white or slightly yellowish, inodorous, without bitterness, very soluble in water, less soluble in alcohol and ether especially when anhydrous, insoluble in the fixed and volatile oils." (U. S. D.) It is also very soluble in glycerin, and almost insoluble in absolute ether, chloroform, benzol, and benzine. It is incompatible with alkaloids, gelatin, albumin, and solutions of tartrate of antimony and potassium, and with ferric salts, with which it forms a black precipitate (the old-fashioned ink.) It does not react with the salts of the ferrous oxide. *If it is rubbed with the chlorate of potassium, the mixture explodes with great violence, hence these drugs should never be ordered in powder together, and if they are prescribed in the same solution, they should be dissolved separately.* From tannic acid is prepared **Styptic** Collodion (containing 20 per cent. of tannic acid in the diluted collodion).

Troches of Tannic Acid (containing each one grain of tannin) and the Ointment of Tannic Acid (containing 10 per cent.) See *Quercus alba.*

The effect of tannic acid resembles more closely that of alum than it does that of any other mineral astringent. It is more irritating, however, than the agent last named. This effect can be reduced in a measure by combination with borax and a small proportion of carbolic acid. A paste prepared by mixing tannic acid two-thirds and gallic acid one-third is thought by some practitioners to be superior as a hæmostatic powder to one in which only tannic acid enters. It enters in combination with gun-cotton and ether, and in this form is known as *styptic collodion.* (See Section on General Surgery.)

A combination of the effects of tannic acid and carbolic acid is obtained as follows: to a half pint of water add one drachm of tannic acid and two grains of carbolic acid; filter thoroughly with care. Glycerite of tannic acid is useful in the proportions of glycerin five parts and tannic acid one part.

A *tannated cotton* is prepared by steeping absorbent cotton in a solution of tannic acid.

Lüderitz (*Berlin Klin. Wochenschrift,* 1890) claims that tannic acid is antiseptic, and that through its presence infusion of coffee is antiseptic.

Tannic acid is of especial value on mucous membranes and on abraded or superficially ulcerated skin surfaces. It is noted that many of its indications are found in localities where sound integument joins a mucus- or ichor-yielding lesion, as at the nostril, anus or vulva, and the margins of ulcers, fissures, etc.

Rosenstirn found that an application of a solution of tannin to the mesentery of a frog actually increased the diameter of the vessels. L. Lewin (*Medicinische Wochenschrift,* April, 1881, p. 202) believes that the astringent effect of the acid is best secured by a powder containing tannin or by the acid used in a pure form, and that solutions of tannin (especially those in which tannin-albuminates have been formed and the precipitate again dissolved in an excess of albumin) constitute a means by which tannin can be applied to the economy without astringent effects following. He makes a statement that tannin-albuminates when formed in the tissues as a result of local application are gradually absorbed in the albumin-bearing states of the tissue fluids and of the blood.

General Surgery.—In fissures it is recommended that a strong solution of chlorate of potassium and tannic acid be applied (see introductory note), or a glycerite of tannin, in which chlorate of potassium is dissolved may be painted over the surface with a camel's hair brush. This is a most satisfactory way of employing these agents. D. Hayes Agnew held tannic acid in high esteem as the foremost of chemico-vital hæmostatics, owing to its power of coagulating albumin.

In Ulcerating Cancer of the breast with a tendency to bleed, the part should be dusted over with finely powdered tannin, and then covered with a bland dressing of zinc ointment and cotton.

B. W. Richardson has called attention to a styptic solution which he calls styptic colloid. It consists of a strong solution of tannin in alcohol mixed with collodion. This forms an elegant application to restrain oozing of blood from large surfaces, and as a protectant in contused and lacerated wounds, especially of the Scalp. Tannic acid has been used by Milkolsky (*Deutsch Med. Wochenschr.*, August, 1888) as a local application for Burns of the first and second degree, in the form of the following mechanical admixture: ℞. Acidi tannici, ʒj; Alcohol., fʒj; Æther., fʒviiss. This is painted over the part until a firm membrane has formed, and the painting is repeated twice daily and covered with a dry compress. Afterward the surface of the wound is dusted over with iodoform.

Philip Miall has employed strong solutions of tannic acid in the treatment of Ingrowing Toe Nails. ℞. Acid. tannic., ʒj; Aquæ, ʒvj, dissolved by gentle heat and painted on the soft parts twice daily. In three weeks a patient so treated had grown a nail of proper length and breadth, after spending many hours on his feet daily without pain.

In diseases of the rectum, such as Fissure and Prolapsus, tannic acid may be employed with great advantage, in the former by separating the parts and dusting over the surface, and in prolapse, as Alison suggests, by applying a strong aqueous solution of tannin. This is especially indicated when there is much relaxation of the parts. In Fissure of the Anus, the glycerite of tannin may be used night and morning, introduced on lint. In Uninflamed Piles, tannic acid ointment, combined with extract of belladonna, may be used with great advantage.

In the genito-urinary tract, tannic acid is extensively employed, either by itself or in conjunction with other remedies. In the latter stages of Gonorrhœa, a five to ten grain solution in rose water may be used as an injection, as advised by Van Buren and Keyes. Ricord recommends: ℞. Zinc. sulph., Acidi tannici, āā gr. xv; Aquæ rosæ, f℥vj, to be injected twice daily.

In Gleet, tannate of glycerin is often of great service, especially when applied locally to the inflamed spot through a speculum or by means of a deep urethral syringe, the exact spot having previously been located by means of the panelectroscope. The same treatment, according to Mansell Moullin, is very effectual in the treatment of Prostatitis and Prostatorrhœa.

Venereal Warts may be destroyed by dusting their surfaces daily with tannin after washing with chlorinated soda (Agnew). Snipping them away with a pair of sharp scissors, and dusting their bases with tannic acid, and touching with nitric acid will always prove a reliable means of dealing with these affections. In Gonorrhœa in the female, after a thorough cleansing with a solution of either alum or tannin, the vagina should be packed with lint dusted over with powdered tannic acid. An important feature in this treatment is the separation of the vaginal walls.

In specific Urethritis in the female, bougies covered with tannic acid are, according to Dr. Hicks, one of the most efficient means of treatment. The best method of preparation is to take a medium-sized gum catheter, moisten it with mucilage of acacia, place it in powdered tannin, and allow it to dry; after which it may be used by inserting it, and allowing it to remain while the tannin is slowly dissolved by the secretions. In the same manner it may be applied to the male urethra or prostate. Chronic Vaginitis of children is often greatly benefited by the application of tannate of glycerin. Tannate of glycerin is a useful application in cases of Erosion on the Cervix Uteri, and also in cases of Chronic Cervical Endometritis. Tannic acid, one grain to the ounce of water, has been used with advantage in cases of Cystitis accompanied by abundant mucous discharge.

Diseases of the Skin.—Tannic acid is employed in the local treatment of skin diseases when an astringent effect is desired.

In Seborrhœa Capitis, Morrow recommends the following preparation:—℞. Acid. tannic., ʒj; Glycerini, fʒj; Vaselini, ʒij; Ung. aquæ rosæ, ℥j. M.

In Hyperidrosis of the feet, a drachm or more of finely powdered tannic acid to the ounce of lycopodium or fuller's earth forms an efficient dusting application.

Dissolved in collodion, as in Richardson's styptic colloid, tannic acid forms an admirable application in Condylomata, in Pernio and in some cases of Erysipelas.

Diseases of the Ear, Throat and Nose.—As a result of experiments upon the trachea of living animals, by J. Rossbach (*Berliner Wochenschrift*, 1882), the effect of tannic acid was found to be similar to that of alum. Under its influence the membrane became pale; the epithelial covering instead of being colorless and transparent, as is normal, assumes a peculiar bluish white or whitish appearance. The underlying vessels were distinctly less red than in the normal state, but whether they are narrowed or widened could not be demonstrated. The secretion appeared to be lessened. The epithelial covering became dry and glistening.

In the treatment of diseases of the ear, tannic acid is but little used. In Chronic Perichondritis of the auricle, a preparation of tincture of iodine one part and tincture of galls two parts, may be freely painted over the skin of the affected parts. Tannic acid is one of the agents occasionally selected in the treatment of AURAL POLYPUS.

Tannic acid is of great value in the treatment of INFLAMMATION OF THE THROAT. It is ordinarily employed in subacute PHARYNGITIS and LARYNGITIS, in the form of the glycerole, having the strength of one drachm of the acid to an ounce of glycerin. It is best applied two or three times a day with the brush, sponge, or by a dossil of absorbent cotton, a few drops sufficing. In a lotion of a strength of about ten grains to the ounce is recommended by some writers in more acute conditions. Nasal washes are weaker and range in proportion of the acid to water from three to five, or as much as 15 grains. But as a rule, it may be said that one of the numerous drugs which contain tannic acid, such as Rhus glabrum, Pomegranate, Geranium maculatum, etc., is to be preferred, since no manipulation of the acid proves to be so agreeable to the patient as a natural combination into which an aromatic principle enters. Wines containing tannic acid may be used as gargles for relaxed throats. Claret wine is popular in this connection. Camerite wine, of Greek vintage, is rich in tannic acid and is serviceable as a gargle in conditions where astringency combined with stimulant is more marked than where claret is indicated.

For EMPYEMA OF THE MAXILLARY SINUS, after drainage has been established one to five grains of tannic acid may be used to the ounce of water, as a lotion. Lozenges and nasal bougies contain from one grain to a grain and a half of the agent. A nasal tampon may be freely powdered with the acid. Snuffs contain about one part of the acid to four or five parts of excipient. The following is the composition of *Dobell's snuff:* one drachm to an equal proportion of camphor, white sugar and high-dried Welsh snuff. Tannic acid is reputed to destroy NASAL POLYPI. In the connection last named, Bryant recommends it as an insufflation, but the galvano-cautery, chromic acid and trichloracetic acid now largely supersede it. It also serves as a valuable dressing in the GRANULATION OF ULCERS. A solution of 20 grains to the ounce has been employed by Bell (*Canada Medical Record*, February, 1884), as an injection to the substance of POLYPUS. Infusions of tea and coffee when allowed to simmer are found to contain tannic acid, and, as these forms of beverage are commonly partaken of, the effects upon the throat are occasionally met with in the form of persistent pharyngeal irritation. In this way it is ascertained what the evil effects of tannic acid may be, when prolonged, even in the event that weak preparations of the drug have been prescribed. The hæmostatic properties of tannic acid are of use in the nose and throat. A ten per cent. solution will suffice. Its properties are increased by the addition of alum. It is not often directed in EPISTAXIS, but is free from objection. One part of iodoform, combined with two or three of tannic acid, carefully triturated, is used as an insufflation in Chronic Nasal Catarrh, as recommended by Bartholow.

Mr. Druitt recommends tannin for the cure of Aphthous Ulcer of the Mouth, and for modifying mercurial salivation, especially when accompanied with spongy, relaxed gums. ℞. Acidi tannici, ʒj; Mel. rosæ, f℥ij; Aquæ, f℥vj; to be used as a mouth wash. Mr. Druitt regards it as one of the most reliable remedies for Toothache, when this depends upon a carious condition of the tooth. ℞. Acidi tannici, ℈j; Mastich, gr. x; Ætheris, f℥ss. After scarifying about the root of the tooth with a fine lancet, a small pinch of cotton is saturated with the above solution and packed into the cavity.

A gargle of the acid in the proportion of ten grains to the ounce is of value in checking capillary oozing after tonsillotomy and uvulotomy.

As a gargle one drachm of tannic acid combined with two drachms of chlorate of potash, an ounce of honey of roses added to a pint of boiling water makes an efficient gargle.* The following formula, which is known in Philadelphia as *Goddard's Astringent Gargle*, is one of the most agreeable forms which exhibit the combined effects of tannin and alum: ℞. Aluminis, ʒij; Cort. granati, ℥ss; Petal rosæ rub., ʒj; Mellis, ℥j; M. Aquæ Bull., ℥vj. Glycerin may substitute for the honey. The mixture can be used without dilution, or with an equal quantity of water.

Owing to its disposition to coagulate mucus and excite irritation in concentrated preparations, tannic acid is no longer used in the local treatment of Croup and Diphtheria. M. Loiseau (*Gaz. Médicale de Paris*, 1861) however, claims that the drug can be directed with advantage in diphtheria, diluted one-half with starch.

In the treatment of Hypertrophy of the Tonsil the powdered acid may be rubbed in with a spatula or fine brush. But such a method must be tedious and uncertain. M. Mackenzie believed that a solution of one to five grains to the ounce of water is, on the whole, the best spray for Chronic Laryngitis. As a hæmostatic in the form of a spray the drug may be used in a strength as high as ten grains to the ounce.

E. F. Ingals accepts tannin as the best astringent to use in Tubercular Laryngitis in equal proportions with morphine and carbolic acid. (Trans. Ninth Inter. Med. Con., Wash., iv, 1887.)

Diseases of the Eye.—Tannic acid is much employed in ophthalmic surgery as an astringent. It diminishes the secretion from an Inflamed Conjunctiva and contracts and condenses the membrane when swollen and relaxed. "Its astringent action is probably due to coagulation of albumin and a 'tanning' of all the tissues to which it is applied." In chronic Conjunctivitis, or in the later stages of the acute form, a solution of from two to five grains to one ounce may be dropped into the eye, or it may be painted on the everted lid in the strength of from ten to thirty grains. If the palpebral conjunctiva is much thickened or trachomatous, the best form of application is the solution in glycerin, as the hygroscopic property of the latter increases the effect. The full strength of glycerite of tannin may be used (Glycerinum Acidi Tannici B. P., one part to four). Powdered tannin is sometimes dusted on the inner surface of the lid. In either case it should be washed off before the lid is allowed to close.

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* See Introduction, for caution.

ACIDUM TARTARICUM. Tartaric Acid.

Tartaric acid is "an acid prepared from the acid tartrate of potassium." (Ph. Br.) It is "nearly or entirely colorless, transparent, monoclinic prisms, permanent in the air, odorless, having a purely acid taste, and an acid reaction. It is soluble in seven-tenths part of water, and two and five-tenths parts of alcohol at 15° C. (59° F.); in five-tenths part of boiling water, and two-tenths part of boiling alcohol." (U. S. P.) It is "incompatible with salifiable bases and their carbonates; with salts of potassium, with which it produces a crystalline precipitate of bitartrate; and with the salts of lime and lead, with which it also forms precipitates. (U. S. D.)

According to Potter, tartaric acid locally used converts the membrane in DIPHTHERIA into a gelatinous mass, which is easily expelled.

ADEPS. Lard.

"The prepared internal fat of the abdomen of *Sus scrofa*, purified by washing with water, melting, and straining." (U. S. P.)

Although the Pharmacopœia directs the "internal fat of the abdomen," yet in the shops the purified commercial lard is used, which is made from the subcutaneous fat as well as from that of the abdomen. Much that is sold for lard is a compound of stearine and cotton-seed oil. When heated this compound gives the offensive odor of heated cotton-seed oil. Lard is adulterated by water, starch, alum, and quicklime (which are added to make it heavier and whiter). Common salt, is mixed with lard to preserve it.

ADEPS BENZOINATUS (benzoinated lard, U. S. P.) is made by digesting two parts of coarsely powdered benzoin in 100 parts of melted lard (below 60° C., 140° F.) for two hours and straining. It is the base of many of the ointments of the United States Pharmacopœia.

Lard, the most common of emollients in general use, forms the basis of nearly all ointments used in surgery as topical applications. The action of lard, or simple ointment, is mechanical, protecting the sore or wound from the irritating influences of the air, which increases the inflammation already present. For the most part, all fats have the same physical properties, differing only as to the melting-point. Fats and oils are used to lubricate and soften the skin, and when rubbed in thoroughly about an articulation which has become stiff from injury or disuse will often assist in restoring its function. Any perfectly bland oil or fat may be used for this purpose. Mutton suet and goose grease have long been held in high repute in domestic medicine. They are valuable for the reason that when properly prepared, they are less apt to become rancid than are other fats. It must be remembered that the blandest fat, when it becomes rancid, is irritating, and will do much more harm than good. It is important in the selection of a fat for the preparation of an ointment that one should be chosen which will soften at the temperature of the body, but at that temperature will not become fluid. Thus, we have in lard a fat admirably suited for the preparation of ointments. In hot weather, white wax, yellow wax, or spermaceti may be added to lard to prevent its becoming fluid. It is important that lard for all medical purposes should be free from salt. Benzoic acid is frequently added to lard to prevent its becoming rancid. We have seen lard as an inunction used with success in the treatment of MARASMUS. Fats and oils are sometimes rubbed into the skin of the whole surface with a view to their absorption, so as to administer to the nutrition of the body. One of the pleasantest fats for this purpose is cocoanut oil. Fats and oils are sometimes rubbed into the skin to prevent the sweating in low, debilitating diseases, as PHTHISIS.

ÆTHER. Ether. Sulphuric Ether.

"A liquid composed of about 74 per cent. of ethyl oxide, and about 26 per cent. of alcohol containing a little water." (U. S. P.) Its specific gravity is 0.750. There is official in the U. S. P. *Æther*, as defined above, and *Æther fortior*, which is defined as "a liquid composed of about 94 per cent. ethyl oxide, and about 6 per cent. of alcohol containing a little water, and of a specific gravity not higher than 0.725 at 15° C. (59° F.)".

It is contemplated that the official ether should be used in preparing certain pharmaceutic preparations, into the finished products of which it does not enter; but for medicinal purposes, either for administration by the stomach or for hypodermic use, and specially for anæsthesia, *æther fortior* is the article to be used. Ether is soluble in all proportions in alcohol, chloroform, benzol, benzin, and the fixed and volatile oils, and dissolves in eight times its volume of water at 15° C. (59° F.). It boils at 37° C. (98. 6° F.)" (U. S. P.). Its vapor, either alone or mixed with air, is highly inflammable. It should be remembered that its vapor is *heavier* than the atmosphere, and if it be used at night the lights should be placed as near the ceiling as may be, and if it is poured from one vessel to another this should be done close to the floor.

General Surgery.—The first surgical operation, beyond the extraction of a tooth, in which ether was used as an anæsthetic was the removal of a tumor by Dr. John C. Warren at the Massachusetts General Hospital, the anæsthetic being administered by W. T. G. Morton.

The choice of an anæsthetic for a surgical operation lies between ether and chloroform (we naturally here exclude nitrous-oxide gas), both being agents equally capable of producing insensibility, although in the case of the latter the effect is brought about much more rapidly and with less discomfort to the patient. So dangerous is chloroform and so safe is ether that there is no excuse for the use of the former agent under ordinary circumstances. The reason of the safety of ether is that, unlike chloroform, it does not suddenly paralyze the normal heart. It may kill by producing asphyxia; but this it does slowly, and in most cases after warning which can be overlooked only through the utmost carelessness. If so unfortunate a result takes place, artificial respiration should at once be practised and continued for a long period.

If definite rules are obeyed, many inconveniences which attend the use of ether may be avoided. The patient should not be allowed solid food for at least six hours before its inhalation; he should be in the recumbent position while inhaling, and all garments about the neck and chest loosened. If the patient is a female, the corsets should be entirely unfastened. If possible, all the clothing should be removed except that ordinarily worn in bed, so that when nausea follows anæsthesia there may be no likelihood of soiling the clothing. Care should be taken that the mouth is clear of every foreign substance. It is well to smear sweet oil or cosmoline about the mouth and nose, as the contact of the ether may cause slight excoriation.

Various mechanical contrivances have been devised for the administration of ether. It is probably true that the best inhaler is that of O. H. Allis, of Philadelphia. The advantage of an inhaler lies in the fact that it is saving of ether; while, on the other hand, except care be exercised, it may become foul. Patients of the better class prefer to be anæsthetized by means of a fresh napkin or towel. In our experience, nothing is found more satisfactory than an ordinary towel folded in the shape of a hollow cone, with a piece of stiff paper between the outer layers of the towel, so as to keep the cone in shape after it has become saturated with the drug. The materials for such an inhaler are always at hand; and, if the cone be properly made, it is both economical and efficient. Some surgeons administer ether by laying a flat, folded towel over the nose and mouth—a plan which allows but slight space for the evaporation of the ether, and possesses the disadvantage of being slow, uncomfortable to the patient, and wasteful. In the Massachusetts General Hospital a hollow cone-shaped sponge is used.

In administering ether the patient should be informed that it may cause a slight choking sensation, which bodes no harm, is of temporary duration and will soon pass away. About half an ounce should be sprinkled over the inner side of the cone, which should then be held over the face, a short distance from the nose, thus permitting the vapor to be well diluted with air. In a short time the air passages become accustomed to the slightly irritant effect of the ether, and then the cone may be held down close over the nose and mouth, the ether being administered in as concentrated a form as possible. In this way a person may be completely anæsthetized with scarcely a struggle. When the conjunctiva is insensible to the touch of the finger, when muscular relaxation is complete and the breathing tends to become stertorous, the stage of complete anæsthesia has been reached. At this point the quantity of ether poured in the cone should be reduced, or none should be added for a few minutes, subsequent additions being made only at times and in quantities necessary to keep the patient unconscious for the desired length of time. The first effect of inhalation of ether is an acceleration of the pulse and respiration, increase of the activity of the salivary glands, with a disposition to muscular movements, which frequently require restraint; the brain, too, is excited, and the patient may cry out. These symptoms demand continuance of the administration of the ether, and not its withdrawal. If the patient has taken solid food before the etherization, vomiting is now likely to occur. If this should happen, the cone should be withdrawn from the face and the patient's head and body be turned well over to one side, while the mouth and throat are freed as quickly as possible of all vomited matters by means of a sponge fastened to the end of a stick, or held in the blades of a pair of forceps. In the absence of these, the finger covered with a fold of towel or napkin will suffice.

The second stage of ether narcosis may be considered to begin with complete loss of consciousness, and the patient soon passes into perfect relaxation, with a slow, regular respiration. The stertorous breathing that is noticed if the drug is forced a little further is due to paresis of the muscles of the palate, and, as a rule, is a warning to give less ether.

The face during etherization is somewhat congested; marked pallor and lividity are always indications of failure of the heart's action or of the respiration, and when these signs appear the administration of the ether should be suspended. It is the habit among some anæsthetizers to cover the entire face and cone with an additional towel, to prevent loss by evaporation. This is a reprehensible practice, as it removes from view one of the best guides to the patient's condition. It is not an uncommon occurrence when a patient is anæsthetized, for muscular relaxation to be so complete that the tongue falls backward, the glottis closes, the face becomes cyanosed, and the pulse frequent and irregular. Death may be threatened from asphyxia. In this event the head should be extended and the jaw pressed forward from behind with the thumb on the angles. It is rarely necessary to drag the tongue forward by means of a volsella forceps or tenacula, as is often done in clinics.

Should so unfortunate an accident as apparent asphyxia occur, artificial respiration should be practiced. The respiratory action may be excited by the use of the electric current, one electrode being placed over the larynx and the other over the epigastrium. Hypodermic injections of atropine and strychnine have been followed by good results. Efforts at resuscitation in these cases should be persevered in for at least half an hour, as apparently hopeless cases have been saved by the use of these means. The time that is required to produce complete anæsthesia varies. If the ether is properly administered, it can usually be accomplished in from five to twelve minutes. During recovery from the effects of anæsthesia some patients become very excited; others awake as from a quiet sleep. The latter mode of recovery is always to be desired, and it is to be encouraged by refraining from all attempts to arouse the patient when disposed to sleep. After arousing from the effects of the anæsthetic, nausea and vomiting are common sequels, but seldom require remedies. Should nausea persist, as it sometimes does in hysterical persons, a hypodermic of morphine will usually suffice to quiet it.

Ether must not be administered to a female without the presence of a third party, if possible one of her own sex, since it is known that women often acquire fixed delusions which can only be met by testimony absolutely proving their falsity. If possible, ether should not be administered to persons who are far advanced in renal disease, as the partial elimination of the drug by the kidneys is a great tax on these organs. While the patient is under the influence of the anæsthetic the body should be kept covered with a blanket and free from exposure to drafts, as in this relaxed state pneumonia or pleurisy is easily contracted. Care must be taken to prevent the ignition of ether from the actual cautery in operations about the mouth. The anæsthetizer should never pour any fluid on the cone, for the purpose of beginning anæsthesia, without first assuring himself of the character of the drug. A patient on recovering from an anæsthetic should never be left alone, but should be watched for several hours after the administration of the agent. When a patient ceases to breathe, or to hold the breath, as is so often the case in the first stage of anæsthesia, a little ether should be poured over the epigastrium, its rapid evaporation having the same effect as though ice-water was thrown upon the surface; it will cause the patient to take a deep inspiration and immediately thereafter to breathe regularly.

Ether may be used hypodermically as a diffusible stimulant in the treatment of shock. Thirty minims should be given at once, and may be repeated every ten minutes until four or more doses are administered. We have found it of great service exhibited in this way at intervals during operations following railroad injuries, when reaction has been imperfect. It is also of service in the threatened collapse following POST-PARTUM HEMORRHAGE. The needle causes a little pain at the point of insertion, which soon passes away without further discomfort. Kums, of Antwerp recommends the subcutaneous use of ether in NEURALGIA, employing 15 minims of ether, or of a mixture of ether and alcohol. The injection should be made as near as possible to the site of pain, the fluid being pressed through the tissues with the finger. He has thus cured RHEUMATIC NEURALGIA, SCIATICA, and TORTICOLLIS.

Attention has been called by S. H. Savage (*Brit. Med. Jour.*, December, 1887) to dementia following the administration of ether. Homans, of Boston, has observed the same effect, the dementia occurring about a week after the administration and lasting about five weeks.

Dr. Jno. H. Packard has described, under the name of "first insensibility" from ether, a condition of brief duration, in which such operations as the opening of an ABSCESS or FELON can be performed without pain. The patient is instructed to hold up his arm during the inhalations; on the relaxation of the arm the incision may be made. Various attempts have been made to induce anæsthesia by the rectum, but it has often caused dangerous diarrhœa and even death, so that its use is to be deprecated. The ether spray has long been used as a means of producing local anæsthesia by partially freezing the selected part. This method may be of service as a preliminary step to the opening of small ABSCESSES, etc. An equally good effect can be produced with rhigoline. The following mixture has been extolled: ℞. Chloroformi, fʒx; Ether, f℥xiv; Menthol, ʒj. We have used this mixture and think it would be improved by reducing the menthol one-half.

Diseases of the Skin.—Sawyer (*Lancet*, July 12, 1890), on the ground that medicinal substances are more readily absorbed when dissolved in ether and painted on the skin, proposes that an ethereal tincture of belladonna should be made of the same strength as the linimentum belladonnæ (B.P.), substituting ether for rectified alcohol and the root for the leaves, since this preparation does not discolor the skin. He also recommends ethereal preparations of iodine and menthol, the latter one drachm to the ounce. Such medicaments are likely to be of use in localized PRURITUS and in URTICARIA. Ethereal tincture of capsicum, made as this writer suggests, is a stimulant in ALOPECIA.

Ether is sometimes used as an injection for the cure of SEBACEOUS CYSTS. Five to ten drops are injected, by means of a hypodermic syringe, into the body of the tumor, the point of the needle being moved around so as to break up its contents. This is to be repeated daily until inflammation sets in.

Diseases of the Ear, Nose and Throat.—A spray of ether may be thrown upon the mucous surfaces in ACUTE CATARRHAL PHARYNGITIS, as quoted by Schech. (*Diseases of the Mouth, Throat and Nose*, p. 99.) Concato and Bufalini recommend that the spray be thrown every two hours, for three or four minutes, from a Richardson apparatus. Ether is recommended by Voillemier as a remedy for EPISTAXIS in children. A wet compress should be saturated with the agent and applied to the forehead. Equal parts of ether and water, or alcohol, may be used as a sedative and antispasmodic inhalant. A teaspoonful of the mixture is added to a pint of water at 80° F.

ÆTHER ACETICUS. Acetic Ether.

Acetic ether is prepared in very much the same way as is the ordinary sulphuric ether, except that in addition to the alcohol used acetate of sodium is also in the still, and from the simultaneous freeing of the acetic acid and ether, acetic ether is produced. Most of that found in the shops contains alcohol and water, and has an acid reaction which does not belong to the pure compound. It has the properties of the ordinary ether with the addition of the very pleasant acetous odor. Cautions that have been given concerning the use of sulphuric ether apply also to its use.

Acetic ether may be substituted for ether in the above preparation. Keene uses the acetic ether in CATARRHAL DISEASES OF THE MIDDLE EAR.

AGARIC. Boletus. Touch Wood. Spunk. Tinder.

The article known under the above names is the agaric of the oak—the *Boletus igniarius*,—a fungus found upon the bark of the oak tree. The inner part is used, and is prepared by slicing and beating with a mallet until soft and readily torn. It is known in France under the name of "*Amadou*," and as there prepared resembles old buckskin.

Agaric is hæmostatic and protectant.

General Surgery.—Owing to the light, tough, and spongy character of agaric it has long been employed as a compress to arrest bleeding from slight wounds, as from LEECH-BITES, for which purpose it may be placed over the bleeding point and retained with a piece of adhesive plaster or bandage. Owing to its physical properties it has also been employed as a compress in INGROWING TOE NAILS; a piece being cut to a wedge shape and forced into the subungual space, and retained there by means of adhesive plaster. For this purpose we should say that it would be greatly inferior to cotton thoroughly packed under the nail and then saturated with collodion and allowed to dry, making a firm, unyielding, perfectly fitting mass, thoroughly capable of supporting the nail.

Boletus, when cut in button-shaped masses and saturated with chlorate or nitrate of potassium, forms what can be used as a MOXA, as a counter-irritant in CHRONIC JOINT AFFECTIONS; although for this purpose at the present day the use of the Paquelin cautery has entirely superseded the use of the moxa, being more reliable and less painful.

Diseases of the Nose.—B. Robinson (*New York Med. Journ.*, September 24, 1887, also *Trans. Am. Laryng. Assn.*, 1887), employs agaric in plugging the nose in EPISTAXIS.

ALCOHOL.

"A liquid composed of 91 per cent. by weight (94 per cent. by volume) of ethyl alcohol (C_2H_5HO; 46), and 9 per cent. by weight (6 per cent. by volume) of water. Specific gravity 0.820 at 15.6° C. (60° F.) and 0.812 at 25° C. (77° F.)." (U. S. P.)

Alcohol is miscible in all proportions with water, glycerin, and ether; dissolves the essential oils freely, but dissolves fixed oil very sparingly indeed. Castor oil is about the only fixed oil freely soluble in it, and this only when the alcohol is of full strength. It dissolves also iodine, and many balsams and resins. Absolute alcohol forms ethylates with potassium, sodium, and lithium. All deliquescent salts, except carbonate of potassium, are dissolved by it, as are also, freely, many of the chlorides.

The "Alcohol Dilutum" of the U. S. P. and the "Spiritus Tenuior" of the Ph. Br. are mixtures of alcohol and water, containing—the first 55 per cent. of water by weight, and the latter 51 per cent. Absolute alcohol is pure anhydrous ethylic alcohol.

Alcohol is incompatible with chromic acid and with permanganate of potassium.

When alcohol is kept in prolonged contact with the skin, evaporation being prevented, a sense of heat and superficial inflammation is produced. Alcohol coagulates albumin and hardens animal tissues by abstraction of water, and, hence, is of value, at times, in forming a thin, protective, air-excluding layer, which promotes healing.

General Surgery.—The stimulating action of alcohol upon the capillaries when applied locally causes them to contract without marked coagulation or clotting of the blood, and has caused alcohol to be regarded as one of the most desirable of hæmostatics, as it always leaves the wound to which it has been applied clean and free from clots or anything which will prevent primary union. Alcohol, diluted with equal parts of a 1 to 1000 solution of corrosive sublimate, is of great service in controlling capillary oozing after amputations. In this way two objects are accomplished—the checking of all oozing and the thorough disinfection of the wound. Alcohol, however, is in itself aseptic, since it is destructive to most life forms. In cases demanding immediate action it is often the only agent that is accessible. At one time it was with Ashhurst a favorite dressing for amputations, the stump being thoroughly enveloped with lint, saturated with equal parts of alcohol and water. We have employed a similar dressing, with the addition of a small quantity of corrosive sublimate (1 to 2000) for granulating surfaces in which a high stage of inflammation has been present. It seems especially serviceable in cases which have been long poulticed, as is frequently seen in neglected FELON. Equal parts of alcohol and water form a convenient evaporating lotion. Alcohol is also a valuable remedy in the treatment of CONTUSIONS about the face, with much ecchymosis. For the removal of the latter Agnew advises the use of equal parts of alcohol, water, and nitrate of ammonium (five grains to the fluidounce), the part to be kept covered with lint saturated with the solution. It is most useful as a stimulating, astringent wash for parts exposed to pressure, in order to prevent the formation of Bed Sores. For this purpose it may be used diluted with equal parts of water, and should be applied with friction. Often the addition of alum will tend to harden the skin and make it less liable to fissure.

Alcohol (or what is used in many of our hospitals—common whisky, on account of its cheapness) is employed to great advantage in Sponging the Limb in Cases of Fracture, after the removal of the bandages, adding greatly to the patient's comfort by restoring the cutaneous functions. In the bloody oozing which is often seen in Carcinoma of the breast, alcohol compresses are often used with most satisfactory results. Uterine Hemorrhage may often be controlled by placing a sponge saturated with alcohol in the cavity of the uterus and causing the viscus to contract. Absolute alcohol is one of the very best materials in which to preserve Catgut Ligatures, as it keeps them firm and does not interfere with their flexibility, while bichloride of mercury and carbolic acid render them brittle and weak.

A mixture of alcohol and white of egg also forms an excellent application in the earliest stages of threatening Bedsore. It is to be applied frequently with a fine brush, and renewed as it dries until an albuminous coating is formed over the excoriated surface. Alcohol has also been used as an antiseptic and for dressing Ulcers and Atonic Sores.

Diseases of the Skin.—Alcohol is employed in diseases of the skin as a local anæsthetic and as an adjuvant to various lotions. The anæsthetic effect depends, in all probability, upon the cold which its rapid evaporation produces. Employed alone or with the addition of chloroform, alcohol is often of benefit as a lotion in Urticaria and some forms of Erythema, especially Erythema Caloricum, or Frost Bite. ℞. Chloroformi, fʒiv; Alcoholis, f℥iv. M.

As an astringent, alcohol acts by hardening the tissues of the skin, and is thus useful in preventing maceration in cases of Hyperidrosis and in other complaints.

Holgate, of New York (*Arch. of Pediatrics*, 1889), treats Nævus by the injection of five to seven minims of 95 per cent. alcohol. The nævus is encircled by a ring on which pressure is exerted to arrest the circulation. The point of the syringe is gradually withdrawn during the injection. The tumor solidifes and the tissues shrink. The injection is repeated at intervals of several weeks until the disappearance of the growth has been effected.

Diseases of the Ear, Nose, and Throat.—Alcohol (95 per cent.) has been recommended for the treatment of Otorrhœa. Opinions have varied with respect to its efficacy. Since the introduction of boric acid and corrosive sublimate treatment the remedy has fallen into disuse; it would appear to be especially indicated in those cases which, after treatment by antiseptic methods and careful cleansing, yet remain unhealed. In a word, in the late stage of the antiseptic treatment if the discharge after cleansing be not diminished, the use of alcohol in the above-named strength stimulates the surface, deposits a coagulate of mucin in the discharge, and corrects odor. It appears to have a special disposition to destroy ASPERGILLUS, and some of its value in the treatment of otorrhea may depend on this factor. In the beginning of the treatment caution should be used, as in some individuals alcohol in almost any strength causes irritation. Absolute alcohol has been tested for the treatment of AURAL POLYPUS, but very properly has fallen into disuse. It is difficult to restrict its action, and instances are known in which inflammation has extended into the middle ear and caused a clot to form in the lateral sinus. (Schwartz, *Naturforscher Versammlung zu Berlin*, September, 1886.)

The first effect of strong alcoholic preparations on the mucous membrane is to constrict capillaries and induce pallor; the secondary effect is to dilate the vessels (Mandl). According to Zaufel (*Wiener Med. Presse*, No. 50, 1883), alcohol in the form of spiritus rectificatus acts most happily, sometimes, in mammilliform perforations of the tympanum.

Absolute alcohol is often diluted with glycerin, since the mixture serves better the purpose of local application than when used pure. It may be joined in proportion of one of the alcohol to four to ten parts of glycerin, or even of equal parts. Such a mixture forms a convenient medium for exhibiting the effects of boric acid, salicylic acid, and carbolic acid. In the weaker preparations these act somewhat alike; the carbolic acid being the least well borne on skin surfaces or in the auditory meatus and the nostril.

The commercial alcohol has been praised by C. Seiler as a remedy in the treatment of CHRONIC NASAL CATARRH. J. Solis Cohen practically admits its value in the treatment of DIPHTHERIA, in making the assertion that the popular tincture of chloride of iron owes its efficacy to alcohol rather than to iron. It has also been used as a mouth wash in NOMA. Claret wine as a gargle in relaxed states of the throat probably owes its virtue to the alcohol present, aided by a small proportion of tannic acid.

G. Vivian (*Phila. Med. Times.* May 21, 1881) recommends alcohol as an inhalant in DIPHTHERIA. He has never seen any constitutional effect arise from its use, although as much as a quart a day may be employed.

Diseases of the Eye.—The delicate cutting instruments used in ophthalmic surgery can be readily cleaned and made aseptic without injury to their edges by thorough wiping with absorbent cotton saturated with alcohol. As an additional precaution they are sometimes previously immersed in boiling water. During an operation they can be kept on a napkin saturated with alcohol, or in a rack over a layer of alcohol contained in a shallow pan or waiter.

Alcohol, though perhaps the most perfect of aseptic fluids, is not antiseptic, and even alcoholic solutions of antiseptics are without value as germicides (Koch, Sattler, and others). Alcohol at any rate is too irritating for application to the eye.

ALDEHYD. Dehydrogenated Alcohol.

Acetic Aldehyd is here to be understood. It is "a colorless, mobile, inflammable liquid, having a rather pungent, ethereal, and suffocating odor." (U. S. D.) Its specific gravity is 0.79. Aldehyd "mixes in all proportions with water, alcohol, and ether, and is rapidly converted into acetic acid by exposure to the air." (U. S. D.) When desired pure it is prepared by a very complex process from alcohol.

Diseases of the Throat, etc.—Aldehyd is sedative and probably astringent to the respiratory tract. As an inhalant it may be employed in the proportion of 80 minims to the ounce of water. For the pharynx a preparation of aldehyd, two parts; carbolic acid, one part; and glycerin, five parts may be applied with a brush; or aldehyd and glycerin may be employed in equal parts. Lennox Browne claims that aldehyd arrests excessive secretion of mucus.

ALTHÆA. Marshmallow.

"The root of *Althæa* officinalis," (U. S. P.) Marshmallow root yields a yellowish white powder, containing much starch and mucilaginous matter, and some saccharine matter. The powder is bland, soothing, and non-irritating, and is an excellent vehicle for more active remedies.

General Surgery.—A decoction of marshmallow is occasionally used as a sedative injection to allay IRRITATION in the vagina and rectum. The root is used in France for children to "cut teeth on," as orris root is used elsewhere.

Diseases of the Throat, etc.—Althæa acts in diseases of the throat as a demulcent. It is not often prescribed. The so-called marshmallow confection of the shops is composed of gum arabic. Pastilles containing althæa are known under the name of "Pastilles guimauve." Althæa is occasionally employed to weaken astringents when it is desired to use these agents in the form of powders.

ALUMEN. Alum.

In the U. S. P. the sulphate of aluminum and potassium is official. In the Ph. Br. both this salt and the sulphate of aluminum and ammonium are official. They are regarded as equal in therapeutic value. Alum is "soluble in ten and five-tenths parts of water at 15° C. (59° F.), and in three-tenths part of boiling water, and is insoluble in alcohol." (U. S. P.)

It is "incompatible with the alkalies and their carbonates, lime-water, magnesia and its carbonate, tartrate of potassium, and acetate of lead." (U. S. D.)

Alumen exsiccatum (burnt alum, dried alum, desiccated alum, dehydrated alum, alumen ustum) is alum freed from its water of crystallization by heat. As an exsiccant it, of course, should be used dry.

Alum and carbolic acid are sometimes united, as follows: alum, two drachms; carbolic acid, one-half drachm; water, one pint.

Alum is astringent, exsiccant, and mildly caustic. It is an important member of a group of remedies which have the property of coagulating albumin.

Alum is used as a hæmostatic, and to check too profuse formation of mucus or pus. Alum acts by constricting vessels and by causing the formation of coagula on wounds. It has but slight penetrative power. It is efficient as an astringent to newly made vessels in granulation tissue. In this way it tends to lessen secretion and to stay capillary bleeding. When used as an exsiccant, it absorbs moisture from the tissues. It is particularly useful in the minor fluxes and inflammations of childhood, and of those adults in whom the tissues are delicate.

General Surgery.—As a hæmostatic alum may be used in the milder forms of bleeding, as from Piles, Leech-Bites or Small Wounds, as well as in Hemorrhage from the Uterus. Powdered alum should be dusted on the bleeding part, or applied in strong solution. Dried alum acts as a mild caustic, being much less powerful than are the salts of zinc or copper. It is sometimes used to destroy exuberant granulations. Alum is an excellent application to small Bed Sores; the following formula is useful: Alum, ʒss; camph., ʒij; the whites of four eggs. Alum added to whisky or diluted alcohol renders either of these substances much more effectual as a topical application to surfaces of the body exposed to pressure, and the combination will sometimes prevent the formation of a Bed Sore. A solution of alum (half a drachm or a drachm to the pint) is often used as an injection in cases of Relaxation of the Vaginal Mucous Membrane, Leucorrhœa, (whether from disease of the vagina or of the cervix), and in Acute Gonorrhœa in women. In the disease last named, it can be directed as a douche, or the vagina may be packed with strips of lint saturated with the weaker solution (one-half drachm to one pint). It is, however, often more irritating than are other astringents.

In Procidentia Recti of children it is sometimes useful to wash the mucous membrane with a lotion composed of one drachm of alum added to a pint of decoction of oak bark.

In Vulvitis of children, few remedies, according to Ringer, can be compared to the injection of a solution of alum (forty grains to a pint of water) followed by its use as a wash, kept constantly applied to the external parts.

Diseases of the Skin.—Alum has very little effect on the unbroken skin, except to harden it slightly. To parts from which the epidermis has been removed it causes a film of coagulated albumin to form, and produces contraction of the tissues and vessels.

Hydrated alum in powder is sometimes employed in Sweating of the Soles of the Feet. Burnt alum is also used for the same purpose, combined with salicylic acid: ℞. Pulv. aluminii usti, ʒv.; pulv. acidi salicylici, ʒijss; pulv. amyli, ʒxv; pulv. talci, ʒxx. M. A solution of alum with sulphate of zinc is sometimes prescribed as an astringent lotion in Erythema Intertrigo and Eczema: ℞. Aluminis, grs. xx; zinci sulphat. grs. x; glycerini, fʒj; aquae rosæ, ad f℥iv. M. D. H. Agnew speaks highly of sulphate of zinc and alum for Pruritus Ani. Equal parts of these salts are placed in an earthen vessel and heated sufficiently to drive off their water of crystallization, or until they become a confluent, hard mass. From half a drachm to one drachm of this substance, powdered and dissolved in a little water, should be thrown into the rectum. In a few minutes it will destroy the itching. It is stated that by this means cures have been effected after the futile application of many other drugs. A solution of ten grains to the ounce of water forms a convenient wash. The powder of burnt alum is sometimes employed as a mild escharotic to reduce exuberant granulations. In Onychia the following wash has proved useful: ℞. Pulv. aluminii usti, grs.iij; zinci sulphat., grs.ij; plumbi subacetat., grs.ij; aquæ, f℥j M.

Diseases of the Ear, Nose and Throat.—J. Rossbach (*Berliner Wochenschrift*, May 15, 1882) found that a solution of alum (strength not given) caused, after five minutes, loosening of the epithelial cells of the membrane of the trachea of living animals.

Pulverized burnt alum is of value in destroying the stump left after the removal of an Aural Polypus. A delicate probe is moistened and inserted in the powder. The quantity which adheres is carried to the desired spot. The drug may be used freely. A lotion of one-half grain to the ounce is prescribed in the treatment of diffuse Inflammation of the External Ear. In Otorrhea, dependent upon a recent perforation in the tympanic membrane, alum should be used sparingly. In the experience of A. H. Buck (*Trans. Otological Soc.*, 1873) a weak solution forced into the tymnic chamber by injection was followed by mastoid disease. He does not state, however, that a similar complication would not have occurred had another medicine been used. A powder composed of burnt alum and starch, to which a small quantity of oxide of zinc has been added, is a popular remedy for moist ECZEMA and other forms of diffuse inflammation of the external auditory passage. Alum must be used with caution in the external ear, owing to the fact that if the powder has taken up moisture from the affected surfaces it is apt to remain as a dry, hard plug, and if much discharge is present may prevent its escape. On this account some practitioners have discarded this agent, but used it on selected surfaces (as for example on GRANULATIONS, POLYPUS STUMP, etc.) it is both efficient and safe. On the whole, it is best to weaken the powdered drug either with an indifferent agent or with one having a slightly different action on the parts.

In the nose, alum has been used in the proportion of from two to five grains to the ounce in PURULENT NASAL CATARRH. Thirty grains to the ounce forms a solution of appropriate strength in preparing a cotton tampon.

Alum may be used as a gargle in PHARYNGITIS, in a strength from ten to fifteen grains to the ounce. The pure powder of burnt alum may be rubbed in the tonsil in FOLLICULAR INFLAMMATION. F. L. Ives prefers alum to all other astringents. Fifteen grains to the ounce of water form a suitable preparation to be used as a pigment for chronic inflammation of the pharynx and larynx. It is one of the most reliable remedies in the relaxed edematous condition accompanied with congestion at the end of an attack of ACUTE ANGINA, MERCURIAL STOMATITIS. Its use should not be prolonged, because of its destructive action on the teeth. It has long been a domestic remedy for "SORE THROAT." A little glycerin, molasses or honey may be added to the lotion. To increase the astringency one of the vegetable drugs which contain tannic acid is often added. A wash of three grains to the ounce has been recommended as a palliative for ADENOID GROWTH of the naso-pharynx when operative procedures are not practicable.

Since writers recommend strengths of fluids in CHRONIC LARYNGITIS of from one to sixty grains to the ounce, it is evident that more than a single purpose is met by preparations so varying in strength. Tauchfuss recommends the inhalation of alum in CROUP.

Insufflations of powdered burnt alum are almost always effective in removing mucus from the arytenoid prominences in ACUTE LARYNGEAL CATARRH. So weak a preparation as two grains to the drachm of powdered acacia or starch may suffice. Equal parts of alum and sulphur, powdered, blown into the throat at the moment of a deep inspiration, is recommended in LARYNGEAL DIPHTHERIA. In the form of a powder burnt alum, as this is found in the shops, should always be used. The chief value which the powdered alum has over the solution is that it acts as an exsiccant; the drier the powder the more efficiently it meets this indication. The conditions to which alum especially responds are two in number; first, the presence of mucus, in which there is more or less of the tenacious fibrinous mass poured out from inflamed muciparous glands. Hoarseness arising from the presence of bands of tenacious mucus between the vocal cords can be relieved by insufflations of powdered burnt alum. A small portion of morphine is sometimes added to the powder with advantage if there be much attendant cough. The alum coagulates the mucin of the material and converts it into an albuminate which is not tenacious and is easily removed. The second indication for its administration is less exact, viz., the relaxed appearance of the membrane due to a moderate amount of œdema in the tissues in the last stage of ACUTE CATARRH. Many other astringents are here equally, if not more, efficient. If not followed by good results at once the alum had better be discontinued; the primary effects are those to be sought for.

Powdered alum mixes well with a number of other powders, among which, in addition to the above, may be named iodoform, boric acid, sodium borate, and salicylic acid. According to H. McNaughton Jones, two parts each of alum and boric acid added to four parts of sodium borate form a powder, twenty grains of which added to an ounce of water may be employed as a gargle. Alum is a weak hæmostatic to the mucous membrane of the respiratory tract. It may be employed as a gargle after tonsillotomy. For free EPISTAXIS it cannot be relied upon, though it is of service in slight capillary oozing.

Alum is warmly recommended by W. E. Casselberry as an insufflation in CHRONIC PHARYNGITIS accompanied with irritative cough, in the following form: powdered alum, acacia, sugar of milk, equal parts.

Lozenges of alum each contain from one to two grains.

Diseases of the Eye.—Alum is a useful astringent in CONJUNCTIVITIS with mucous or purulent discharge. Acute conjunctivitis with only aqueous secretion is best treated with cold water applications or hot stupes and soothing detergent washes of boric acid, either alone or combined with borax, or, if there be much irritability or burning, with cocaine. Severe chronic cases usually require more stimulating applications. Alum is best adapted to acute or mild chronic cases with more or less discharge, the amount and character of which may determine the strength of the solution and the frequency of its application. In MUCO-PURULENT CONJUNCTIVITIS it may be used in solution of from one-half to two grains to one ounce, combined with ten grains of boric acid, dropped freely into the conjunctival sac three or four times a day. From two to four grains of morphine solution is sometimes an agreeable addition. In OPHTHALMIA NEONATORUM one or two grains of alum may be added to the boric acid wash, with which the eye is thoroughly cleansed every hour or two. In the GONORRHŒAL OPHTHALMIA of adults it may be used in the same way in rather stronger solution, though in this disease most surgeons prefer bichloride of mercury. Alum (one-half grain to one ounce) may be conveniently combined with atropine when conjunctival inflammation complicates cases of IRITIS or KERATITIS. Some authorities (Tweedy, Brunton) have claimed that alum has a tendency to increase ulceration of the cornea by "a solvent effect upon its cementum." This charge can hardly be considered proved, but such cases usually bear irritating applications badly, and demand antiseptic rather than astringent treatment. In CHRONIC PALPEBRAL CONJUNCTIVITIS the solid crystal of alum is a useful application. It is dipped in water and passed over the everted eyelid, which should be washed before it is allowed to close. Crystals cut into pencils and fitted with handles are supplied by druggists.

"*Alum curd*" is used to prevent ecchymosis after contusion of the eyelids. It is made by adding powdered alum to milk or white of egg until a curd is formed. It is a grateful application but should not be relied upon to the exclusion of scarifications and ice.

AMYGDALA. Almond.

"MIXTURE OF ALMOND."

To prepare this the almond is first "blanched" by immersing it in hot water for a minute or two, which softens the adherent skin and it is then readily removed by the fingers. The almond is then put into a mortar, beaten with acacia and sugar, and triturated with water (added little by little) until a thorough mixture is formed. This is strained, and that which passes through the strainer forms the "mixture of almond." If a proportion of bitter almond be used with the sweet almond, some oil of bitter almond is generated, which gives a pleasant odor to the preparation. Made in this way the preparation will not keep, and requires either the addition of salicylic acid or a proportion of alcohol to prevent it from spoiling. "Mixture of almond" is used as a vehicle for the application of more active medicinal cosmetics.

OLEUM AMYGDALÆ EXPRESSUM.

"A fixed oil expressed from bitter or sweet almond." U. S. P. The process is simply the pressing of the cleaned almond between warm iron plates. (By mixing crushed *bitter* almond and water, the volatile product called in the Pharmacopœia "*Oil of Bitter Almond*" is generated and can be separated by distillation. It must be carefully distinguished from the expressed oil, as it is irritant and poisonous).

The oil of sweet almond is a favorite menstruum for the dilution of menthol, creasote and naphthol.

General Surgery.—Almond oil, when pure, forms a bland preparation which may be applicable for the same purposes as sweet oil.

Diseases of the Skin.—In addition to entering into the composition of several valuable ointments the oil of almond is used as a bland application to the inflamed skin, and especially to soften crusts and scales preparatory to more active treatment. Carbolic acid is sometimes added to almond oil as a local treatment in PRURITUS. (See Ol. Olivæ.)

UNGUENTUM AQUÆ ROSÆ. Cold Cream.

℞. Expressed oil of almond, ℥v; spermaceti, ℥j; white wax, ℥j; rose water, ℥iij. Melt together by means of water bath, and stir the mixture constantly while cooling.

FARINA AMYGDALÆ. Almond Meal.

This is usually prepared either from sweet almonds, or from sweet and bitter almonds together, by blanching them (*i. e.*, removing the epidermis by immersion in hot water), then either grinding them to a meal in a suitable mill as they then are (in which case the product is an oily meal), or pressing them between hot plates to remove the oil, and then grinding the "cake." If a proportion of bitter almond be employed, the meal when mixed with water will give off the odor of oil of bitter almond; otherwise, it is odorless. The oily meal soon becomes rancid, but when fresh is more demulcent than is the meal made from the expressed cake. A less elegant almond meal is made by grinding the cake left after the commercial expression of oil of sweet almond. This meal is brown in color, because of the non-separation of the epidermis.

Diseases of the Skin.—Both the bitter and the sweet almond are used in the treatment of skin diseases. The crushed kernel of the bitter almond is employed in the form of cataplasm applied in cases of PRURITUS VULVÆ, while the oil has been employed dissolved in water of the strength of one drop to the ounce, to allay general pruritus. The virtue of bitter almond is due to the hydrocyanic acid it contains.

The mixture of sweet almond is used as a vehicle for various lotions, particularly those employed upon the face.

Almond meal gives a peculiarly soft and soothing quality to water, and is often used in washing the hands when chapped or eczematous.

AMYL NITRIS. Nitrite of Amyl.

"A liquid produced by the action of nitric or nitrous acid on amylic alcohol, which volatilizes between 262° and 270° F. It consists chiefly of nitrite of amyl. It should be stored in hermetically-sealed vessels, or in well stopped bottles, and in a cool, dark place." (Ph. Br.) "It is insoluble in water, but soluble in all proportions in alcohol ether, chloroform, benzol, and benzin." (U. S. P.)

Nitrite of amyl is antispasmodic. Upon the skin it acts the part of an irritant.

Nitrite of amyl is used either by inhalation or subcutaneously. Its ready volatility interferes with its use externally in the form of liniment, as recommended by Kurz, of Florence (*Practitioner*, February, 1882); because, when it is thus employed, the patient cannot fail to inhale more or less of its vapor, and in this way may come under its influence to a dangerous extent. All persons are not affected alike by nitrite of amyl, some being able to inhale ten drops without inconvenience, while a drop will affect others, producing great giddiness. The first dose should always be taken under medical supervision. It should be borne in mind that the symptoms increase for a minute after the withdrawal of the agent. As a rule anæmic persons bear much larger doses than those who are not anæmic. The patient should always be seated while inhaling nitrite of amyl. Patients after a time become habituated to its use, so that the dose has to be rather increased or repeated.

In ANGINA PECTORIS, nitrite of amyl, since its use was suggested by Richardson in 1864, has held a foremost place among our modern appliances for the relief of this distressing complaint. Three to five drops are to be placed upon a handkerchief and held under the nostril. The promptness with which this agent acts is marvelous in a large majority of cases. If it fails—as of course, it sometimes does—recourse must be had to chloroform. In SPASMODIC ASTHMA and CARDIAC DYSPNŒA, we have employed nitrite of amyl by inhalation with benefit.

In EPILEPSY, according to the testimony of S. Weir Mitchell and others, nitrite of amyl may be employed with advantage as a palliative. Immediately upon the aura being felt, a few of the pearls containing the drug may be broken upon a handkerchief and the contents inhaled, or a few drops may be taken from a small phial. In PUERPERAL CONVULSIONS, W. F. Jenks found nitrite of amyl efficient, but liable to induce uterine relaxation. In LUMBAGO a ten per cent. solution may be injected into the back, with the most happy results, relieving both the pain and stiffness. In CHLOROFORM POISONING, nitrite of amyl inhalations have been employed with advantage.

Diseases of the Ear, Throat and Nose.—Nitrite of amyl is used as an inhalant in ASTHMATIC ATTACKS, and to overcome SPASM OF THE GLOTTIS. Eight minims of the drug may be added to an ounce of alcohol. A teaspoonful of this mixture is mixed with a pint of water at 100° F. Chloroform, however, is a superior agent. One of the chief uses for the inhalation of nitrite of amyl is to overcome the toxic impression of cocaine. (*Journal of Laryngology and Rhinology*, Vol. 1, 1887, p. 166.)

The inhalation of six drops of the nitrite of amyl from a handkerchief is found valuable at the beginning of an attack of HAY-FEVER. (*L' Union Médicale*, January 10th, 1891.)

AMYLUM. Starch.

In the U. S. P., wheat starch alone is official. ("The fecula of the seed o *Triticum vulgare*"). In the Ph. Br., however, the starch of wheat (*Triticum vulgare* and *T. sativum*), of Indian corn (*Zea mays*), and rice (*Oryza sativa*), are all official. Corn starch is drier and more absorbent than is wheat starch. Rice starch is practically unused in this country, the "*Fleur de Riz*," sold under the name of "baby powder," being usually made from corn or wheat starch.

Starch is sometimes adulterated with or substituted by potato starch, and rarely mixed with carbonate and sulphate of lime, and with water.

Starch powder is protectant and demulcent. In addition, it forms a convenient vehicle for the distribution of insoluble powders, such as oxychloride of bismuth, subnitrate of bismuth, etc. As an ingredient of snuffs, etc., it is usually employed in combination with powdered acacia, which renders it more adherent.

General Surgery.—Starch poultices are of service for the softening and removal of dried secretions about the scalp and face. A bandage saturated with starch is used in surgery, where a fixed dressing is desirable to lend greater firmness or solidity to the ordinary roller bandage. When the starch bandage is applied two rollers are necessary, the inner one being saturated with thick starch, and the outer one being left dry. The starch bandage requires from thirty to forty hours to dry, and for this reason it is not so convenient as plaster-of-Paris, which has almost entirely superseded it. We have found starch of service smeared on bandages which are used for retaining extension apparatus on the leg and thigh, thereby rendering them smooth and preventing displacement. Starch in solution is a valuable menstruum for the administration of sedative applications or remedies in various diseases of the rectum; for instance, in an attack of PILES, when the inflammation is confined to a slight œdema and redness of the external folds, an injection of thin, warm starch, particularly when combined with belladonna or opium, is a soothing application. Injections of laudanum and starch water have long been held in high repute in cases of DYSENTERY and DIARRHŒA. In this way starch, from its bland nature, may be of service in rectal medication in country practice. Two to four ounces can be readily thrown into the rectum and retained there without inconvenience.

Diseases of the Skin.—Wheat starch is the form commonly used in making applications to the skin, though corn starch is also employed.

Alone or in combination with other absorbents, finely triturated starch prevents CHAFING. Its action is even thought to have slight sedative and astringent properties. Starch, when boiled with water to a jelly, has a demulcent and soothing effect on the skin, and in the form of starch baths, with or without the addition of bicarbonate of sodium, is of value in ACUTE ECZEMA, PRURITUS, and other inflammatory diseases. (See *Baths.*)

A *starch poultice* is made by mixing the dry starch with enough water to make a paste. Boiling water is then poured on the mass and the mixture, being briskly stirred the while, is heated for some minutes. The resulting gelatinous paste is spread on tarletan or thin cloth. It should be uniformly translucent and without lumps. The poultice should be thick, and it is better to cover it with paraffin paper, oiled silk, or other impermeable covering, to prevent too speedy desiccation. The addition of thirty grains of boric acid to the ounce of starch, in making the starch poultice, converts it into a disinfectant application.

Starch poultices are very useful to remove crusts, etc., without producing irritation, in inflammatory conditions of the skin.

As starch readily decomposes in the presence of heat, moisture, serum, ichor, etc., the addition of a few grains of salicylic acid to starch powders is advisable, where there is any discharge.

A teaspoonful of dried starch dissolved or mixed in a quart of water makes a convenient lotion for macerating the crusts in ECZEMA OF THE SCALP in infants. Two or three folds of linen soaked in this fluid are placed upon the scalp and covered with a rubber cloth. One or two drachms of boric acid may be dissolved in this quantity of lotion to counteract decomposition. The application is renewed from time to time until the skin is soothed and prepared for other forms of treatment.

ANTHRAROBIN. Desoxyalizarin.

Anthrarobin is "a product of the deoxidation of alizarin. It is a yellowish-white powder, insoluble in water, soluble in alcohol or dilute alkaline solutions." (National Medical Dictionary.)

Anthrarobin is parasiticide and alterant.

Diseases of the Skin.—Anthrarobin was introduced by Behrend as a substitute for chrysarobin. Its action is similar, but much less energetic than that of the agent last named, but it is without its objectionable irritating or poisonous qualities. Thus it may be used over extensive surfaces with impunity. It causes a brownish discoloration of the skin and nails, and indelibly stains muslin and linen. Applied to the face it not only discolors the skin, but sometimes give rise to a slight burning feeling; it excites no serious irritation, excepting occasionally in the case of infants.

As a parasiticide, it has been used successfully in ERYTHRASMA, TINEA CIRCINATA, and TINEA VERSICOLOR. It has also been used in PSORIASIS, and by Bronson in CHRONIC ECZEMA and ULCERS. The alcoholic solution, one drachm to the ounce, decomposes in a few days, but when fresh is efficient. Anthrarobin is, however, commonly employed in an ointment of half a drachm to the ounce, or in the form of powder applied to ulcers.

ANTHEMIS. Chamomile.

"The flower heads of *Anthemis nobilis* collected from cultivated plants" (U. S. P.). Chamomile contains a bitter principle, of an acid character, and an essential oil. The oil appears to be the active constituent.

Diseases of the Ear and Throat.—A fomentation of chamomile flowers is an ancient simple in domestic practice for OTALGIA. Chamomile has a secondary position among topical agents in affections of the respiratory tract. Inhalations of a hot infusion may be used as an adjuvant in ACUTE SORE THROAT in children, in which a spasmodic element is present.

Diseases of the Eye.—A small bag of thin flannel, containing chamomile flowers, dipped in a hot infusion of this herb, forms a convenient means of applying moist heat in ophthalmic practice.

ANTIMONII OXIDUM. Oxide of Antimony.

"A heavy, grayish-white powder, permanent in the air, odorless and tasteless, almost insoluble in water, and insoluble in alcohol" (U. S. P.).

Diseases of the Throat.—One to five grains, in the form of a powder, is recommended by J. Solis Cohen in CHRONIC LARYNGITIS. It is described as a relaxant.

ANTIMONII ET POTASSII TARTRAS. Tartrate of Antimony and Potassium. Tartar Emetic.

Tartrate of antimony and potassium is rubefacient, counter-irritant, and vesicant.

General Surgery.—Tartar emetic is occasionally used, locally, in the form of the ointment, as a rubefacient. Spread on lint it excites on the skin a characteristic inflammation, at first papular, then vesicular, and lastly pustular. The eruption thus runs the course of that of smallpox and simulates it closely; it often leaves minute scars.

An ointment of the drug was formerly ordered when a powerful and persistent irritant action was desired, but its use is to be deprecated, as the blister it produces is unusually severe and liable to be followed by an ill-conditioned ulcer.

Rigley (*Obstet. Jour.*, Sept., 1877) speaks highly of the use of the tartar emetic ointment over the seat of the disease in SUBACUTE OVARITIS.

Diseases of the Throat.—Although the effect ordinarily induced by tartar emetic on the respiratory passages is a constitutional one, it is sometimes convenient to administer the drug in the form of a lozenge, in combination with another agent. Thus, S. Hartwell Chapman orders $\frac{1}{100}$ of a grain of the antimony salt with $\frac{1}{50}$ of a grain of codeine, in the form of a lozenge, in ACUTE INFLAMMATION OF THE THROAT, when accompanied with fever.

ANTIFEBRINE. Acetanilid.

General Surgery.—Antifebrine has been used locally as an application for the treatment of CHANCRE and CHANCROID, but iodoform, or black wash, will, as a rule, be found a more satisfactory means of treatment.

ANTIPYRIN.* Dimethylphenylpyrazolon; Phenazonum Ph. Br.

Phenazone is in the form of pearl white crystalline scales. It is bitterish in taste, readily soluble in water, soluble in about fifty parts of ether, and very soluble in chloroform and alcohol. Under the name of Phenazonum (Phenazone) it has been recently added to the British Pharmacopœia.

Antipyrine is sedative, moderately analgesic and hæmostatic.

General Surgery.—R. Robinson (*Rev. Gén. de Clin. et de. Thérap.*, March, 1890) reports a case in which a ten per cent. solution applied to the cervix controlled UTERINE HEMORRHAGE after other remedies had failed. A fifty per cent. solution of antipyrin, injected at the point of greatest distress, has been used hypodermically for the relief of pain in LUMBAGO, SCIATICA and INTERCOSTAL NEURALGIA. (*Wiener Med. Wochen.*, March 1889.)

It has also been used with starch on a tampon to relieve the pain ot UTERINE CANCER, which it does very effectually. A mixture of antipyrine, two parts, and vaseline, three parts, in an ointment, has been applied to ULCERATING CANCER OF THE BREAST with a tendency to bleed, with asserted benefit. Washing the parts with a five to twenty per cent. solution of antipyrin is of service to control the capillary oozing after operations. Glinsky (*Brit. Med Jour.*, May, 1889) has tried antipyrin for hemorrhage with unsatisfactory results. It was applied in powder, or in plugs saturated with a five to ten per cent. solution. A one-half per cent. solution has been used with asserted advantage in GONORRHŒA.

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* Antipyrin is the copyrighted name of this chemical when made by a special patented process, and Antifebrine is the copyrighted name of Acetanilid.

Diseases of the Ear, Nose, and Throat.—F. W. Hinkle (*N. Y. Med. Jour.*, Oct. 20, 1888), believes that antipyrin is a valuable adjuvant in the treatment of NASAL CATARRH. A four per cent. solution may be sprayed into the nostril. At first a slight smarting sensation is produced, but the subsequent impression resembles that of cocaine. In a recent communication to one of us, Dr. Hinkle reasserts his statement respecting the effect of antipyrin in irritable states of the mucous membrane. It is a mild sedative, and free from the inconvenience and objections of cocaine. It is not contra-indicated in solutions of this agent, but appears to increase its value. The impression is less decided than is the case with cocaine, while more persistent. Subsequent observers claim that this impression is due to its absorption into the system; the effect, therefore, is not strictly local, since the internal administration of the drug produces a similar effect upon the nasal mucous membrane. Occasionally subjects will be found who cannot permit the use of antipyrin in any strength, it proving to be with them irritating.

Hæmostatic properties have been claimed for antipyrin. Both Hinkle and Henorque (*Gaz. hebdom.*, Jan. 13, 1888, p. 29) employ for this purpose a strength of one part to five. It appears to be especially useful in checking bleeding from a CANCEROUS ULCER. B. Robinson (*N. Y. Med. Jour.*, Sept. 24, 1887) recommends antipyrin in capsules for epistaxis, in strength of solution varying from five to fifteen grains to the ounce of water. Its analgesic effects are increased by combining with it a small portion of morphine. In this manner H. Snow (*Brit. Med. Jour.*, Feb. 16, 1889) has employed it in the treatment of MALIGNANT GROWTHS OF THE MOUTH AND TONGUE.

Diseases of the Eye.—Antipyrin has been used with asserted good effect in clearing up CORNEAL OPACITIES. As it has been dusted on the cornea with calomel, its effects cannot be separated from those of this old standard remedy.

AQUA. Water.

The uses of water in the local treatment of disease are numerous. Apart from the indirect aid secured by cleansing foul surfaces, water can be employed, according to the temperature to which it is raised, to answer a variety of indications; in a word, it is a convenient means of controlling degrees of heat. Dry heat (ordinarily obtained by radiation from a metallic surface) can be maintained by passing previously heated water through flexible metallic tubes (Leiter tubes). Water exerts no specific action on living tissue; it acts by presence, or by its temperature.

General Surgery.—Water, since the earliest time, has held an important place in local therapeutics, forming, with other substances, the basis of nearly all liquid preparations. When employed as an adjuvant it is important that water should be as pure as possible. Many running waters and well waters, owing to the nature of the surrounding soil and proximity to decomposing animal and vegetable substances, are unfit for surgical purposes.

Distilled water of the shops is considered to be pure, although it frequently partakes of the character of the still through which it passes, and thus may contain in solution salts or oxides of lead, iron, or copper. In hospital practice, distilled water may be collected from the "steam plant," ordinarily employed in conveying steam for purposes of heating the buildings. The water may be collected from the iron pipes of distribution, or from the "exhaust" of the engine, when it will be found to contain small globules of oil. Under all circumstances it is well to filter and boil distilled water before using. Closely stoppered glass bottles are the best vessels in which to preserve distilled water.

In the absence of distilled water, spring, rain, river or cistern water may be substituted. Such water should be filtered and boiled before being used in flushing serous cavities. It is important that it be freshly prepared.

Water acts chiefly as a direct means of modifying temperature; if applied cold it abstracts heat from the body, and is a sedative. Water at a higher temperature than the body may be considered to act as a stimulant. As it is a property of all living organisms to react against what tends to depress them, cold applied to the body, in a certain measure and for a fixed time, produces a diminished activity of function, but this is followed by a greater degree of activity than that which originally existed. In this manner the primary effect of heat and the secondary effect of cold resemble each other. Hence it may be seen that different degrees of heat and cold may produce various grades of effect, from a mild to a powerful stimulation, and thence to the destruction of vitality.

Celsus mentions the value of cold water in arresting HEMORRHAGE, and that the healing of slight wounds is facilitated by the application of a sponge saturated with cold water.

In the treatment of CONTUSED and LACERATED WOUNDS, water dressings are held in high repute. They may readily be combined with germicidal or deodorizing agents. The simplest way of applying a water dressing is, after adjusting the parts, to apply over them pieces of old linen or lint which have been saturated with water, renewing them as often as they become deprived of their moisture.

The following method is recommended when irrigation is resorted to:

A piece of rubber cloth, fashioned into a gutter so as to convey the redundant fluid into a vessel at the side of the bed, and to prevent the bed and patient from becoming wet, is placed beneath the affected part. A vessel containing the water is placed at a slight elevation and a few strips of lint are carried over the side to the selected dressing. The fluid will find its way by capillary attraction along the lint and diffuse itself through the dressing, and run off, when this has been surcharged, on the rubber cloth. Another method is to have a suitable vessel provided with a stop-cock, which will permit the water to escape in a small stream, or by drops, as the attendant may desire.

It is important that the water should not fall from a height, as the constant dropping often causes distress. Cold water was extensively used in GUNSHOT WOUNDS during the late war between the States, and, as a primary dressing, answered a good purpose. If too long continued, however, it produces a depressing influence on the part, the granulations become pale and flabby, and exhibit an indisposition to heal. It is difficult to state positively what should be the temperature of the water to be employed. As a rule the feelings of the patient are to be consulted. If cold water causes a sense of chilliness and discomfort, it should at once be changed for warm water, or be discontinued. Cold water is usually preferable in the early stage of inflammation, when it will assist in promoting resolution, but is not desirable when suppuration is impending, or when danger of gangrene is imminent.

Warm water is of service in the early treatment of severe LACERATED and CONTUSED WOUNDS, where the vitality of the part is threatened. It is here best applied by irrigation; care will be required to keep it at the desired temperature. Some practitioners prefer to irrigation that the tissues involved be immersed in a bath of warm water.

The effect of either heat or cold may be obtained indirectly by the use of a *Petitgand* or *Leiter's* coil, by a rubber bag filled with water, or, if cold be desired, one filled with broken ice. The latter method is extensively used in the treatment of CONCUSSIONS or THREATENED INFLAMMATION OF THE BRAIN, in order to reduce as much as possible the vascularity of the meninges.

In temporary, non-reducible HERNIA, which if left to itself may soon become strangulated, the ice bag, or in its absence, cold water on a lint dressing, will in many cases prove a satisfactory application. Not infrequently a scrotal hernia thus treated will spontaneously disappear after an application to the scrotum for two or three hours. In all cases of strangulated hernia, when it is necessary to wait for the arrival of the surgeon it is well to apply cold to the tumor, as a means of preventing inflammation.

In severe SPRAINS and CONTUSIONS OF THE ARTICULATIONS there may be lesions of the synovial vessels, or of the membrane itself. At the best, contusions exist in the subserous vessels which, becoming hyperemic, may induce an attack of arthritis. The first indication, therefore, in the treatment of sprain is to control the impending inflammation. This can be satisfactorily accomplished by elevating and surrounding the articulation with cloths saturated with cold water or by an ice-bag. If a patient is seen immediately after the injury is sustained, great relief may be secured by the application of a firm roller bandage about the joint; if the injury is in the ankle, the bandage should be carried from the toes to the knee. Cold, elevation, and pressure produce tonic contraction of the walls of the vessels, lessen the weight of the column of blood, and furnish mechanical support to the vessels themselves. As a consequence, they diminish the tendency to serous extravasation and swelling, and favor speedy restoration of normal functions.

If the tension and throbbing of the joint do not soon begin to subside after the employment of cold applications, these must be immediately changed for hot ones. In severe pains Agnew states that he usually finds that warm applications give the greater comfort.

As a means of controlling HEMORRHAGE, particularly the oozing of blood from the surface of a wound, or that occuring from the flaps of a stump after the principal vessels have been tied, cold water, or even ice water, was frequently used by the older surgeons. When such a stimulating effect of cold is desired it is best to project the water forcibly against the bleeding surfaces from the nozzle of a syringe, for this produces a stimulating effect by the impact of the water as well as by the cold. This is also an excellent means of controlling the oozing following the operation for lithotomy. Care must be taken not to continue the local use of cold too long, as serious depression may follow. Water as hot as can be borne, namely, at a temperature from 110° to 130° F., is now more used as a hæmostatic than cold water, especially for the control of capillary oozing. This means of treatment was favorably brought to notice by the late Charles T. Hunter, of Philadelphia. We are in the habit of wetting a towel or napkin in hot water, squeezing out the redundant fluid and placing it against the bleeding surface, retaining it there with firm pressure for a short time. After its removal the surface will present a blanched appearance. In cases of oozing after the wound has been closed with stitches, and the drainage-tube has been inserted, the wound can be slightly distended by obstructing one end of the tube and injecting hot water through the other, permitting the water to remain for a minute and then draining it off. Care must be exercised, especially when a patient is under the influence of ether, that the water does not scald the part.

In abdominal and pelvic surgery PROFUSE BLEEDING FROM TORN ADHE-

SIONS can be arrested by flushing the abdominal cavity with water at a temperature of 110° F.

In the use of water as a hæmostatic, it must be remembered that the entire success of the method depends upon the fact that the water is used either hot or cold, *tepid water or lukewarm water having a tendency to encourage bleeding.*

For sterilizing instruments before and after operations, hot water is extensively used in the absence of a hot-air sterilizer. No danger need be apprehended of removing the temper from steel instruments, as sometimes happens when heated air is used. This method is, however, open to the objection that in a short time hot water will discolor steel instruments, although this can be almost entirely obviated by adding a small quantity of bicarbonate of soda or ammonia to the water. Keeping the instruments in the hot bath is preferable to placing them in a solution of carbolic acid.

In making aqueous solutions for hypodermic medication, sterilized water is always to be preferred. The danger of causing local irritation is in this way lessened.

HEMORRHOIDS are frequently treated with cold water injections. It was a favorite remedy with Sir Benjamin Brodie, and is recommended by Curling and Kelsey. The water injections have a twofold object: One is to soften and break up the fecal masses, and the other to increase the tonicity of the muscle-fibres, both of the bowel and of the dilated blood-vessels. Brodie advised half a pint of cold water fresh from the pump as a lavement every morning after breakfast, to be kept in the rectum as long as possible. Van Buren advises that the patient should first inject into the bowel three-fourths of a pint of tepid water, with a view to bringing the motions readily away. After the evacuation has been effected four ounces of cold water are to be injected. The enema may be retained or passed.

In CONSTIPATION a simple enema of cold water is frequently used, to which may be added soap and sweet oil, or glycerin. The method is of service in cleansing the lower bowel previous to operations about the genito-urinary tract, both in males and females. The use of an enema is of great service to persons of active habit, who are temporarily confined to bed, as in case of fracture of the leg, etc. In many of these cases the rectum will be found engorged with fecal matter—purgatives by the mouth having little effect until the accumulation is removed by an injection of warm water and soap. However, the daily use of an enema as a routine practice is to be discouraged, as the bowel becomes accustomed to the unnatural stimulus, and fails to normally respond.

Plain hot water is of frequent use in washing out the bladder. In doing this it should always be remembered that a healthy bladder, and much more an inflamed one, can be irritated by the introduction of large and rigid instruments. The viscus is accustomed to be distended gradually by the urine; and the aqueous distention should conform, at least in some respects, to that process. Thompson advises, when washing out the bladder for CYSTITIS, etc., never to introduce at one time more than two ounces, and even this quantity is sometimes too large. A flexible catheter should be used, and the water should be at a temperature of 100° F. The fluid should be thrown in very slowly, and the injection repeated several times until the fluid comes away clear. As Thompson states, washing out the bladder may be either an efficacious mode of treatment, or a mere contrivance for inducing serious irritation. The propriety of washing out the bladder, either with plain or medicated water, is considered by Agnew to be of doubtful propriety. Plain warm water is often used as an injection in the early stages of GONORRHŒA, before the mucous membrane will bear stimulating or astringent applications. It is also an efficient application to the integument of the penis in this disease. Bumstead, Taylor, and Milton ("Milton on Gonorrhœa," p. 21) advise that the water be as hot as can be borne. Thus applied, in the early stages of the disease, the weight felt about the testicles disappears, the pain on making water and using injections is assuaged, and the prepuce and glans rapidly regain a normal temperature and color. The patient should immerse the organ in a cup of hot water for a few minutes after urinating, and before and after using an injection. In the treatment of PHAGEDENIC CHANCROID, prolonged hot water Sitz baths used for many hours are recommended by Hill and Cooper (p. 486). When it involves the penis, the organ may be immersed in a suitable sized bottle or a rubber bag, frequently changed, and kept at as high a temperature as the patient can bear.

In addition to the above, it has been thought advisable, at the risk of slight repetitions, to include at this place a separate section on the use of hot water in gynecology. For a full understanding of these beneficial effects of hot water the profession is indebted to Emmet. This writer states that heat, unless at a temperature which would destroy the parts, does not act as promptly in causing contraction of blood-vessels as does cold. In fact, its immediate effect is to cause relaxation and to increase the congestion of the parts, but if its application be prolonged, reaction ensues and contraction takes place. In other words, the reaction from heat is contraction. The immediate effect of cold upon the capillaries is contraction, and with reaction comes dilatation; but the reverse is true of heat which causes first dilatation and secondarily contraction. It is considered that, except in displacements of the uterus, more can be accomplished in the treatment of diseases of women by the use of hot water and carefully regulated general treatment, than by all other means combined. The general opinion of gynecologists is in accord with this view. The old practice of using cold, or even iced water, for vaginal injections has been largely superseded. The "fountain" syringe, the vaginal irrigator, or the Davidson syringe can be used for administering the vaginal douche. The shank of the straight tube should be five inches in length. The extremity should have small openings, but no opening should be at the end. In the opinion of some practitioners an especial advantage obtains from an interrupted stream of water. In the sitting posture no good beyond the mere cleaning is obtained from the douche, and it is not free from danger, since the water may enter the uterus, which now lies in a changed axis to the vagina with slightly dilated os. But when the woman is placed in the knee-chest, or in the dorsal position with the hips elevated, the action of gravity is brought into play. The vagina is thus kept fully distended by the weight of the water; the hot water will be in contact with every portion of the mucous membrane under which the capillaries lie, and the pelvic veins will be emptied and only the surplus can run off. It is impossible for the woman to derive full benefit from the hot douche when administered by herself. If the douche is given for the relief of venous congestion, the temperature of the water should be hot, commencing at 100° and gradually increasing every day until 120° is reached. A large quantity of water should be used for the injection—at least a gallon. In cases of pelvic inflammatory trouble, it should be administered two or three times a day. It is best for the patient to remain in the recumbent position for some time afterward, and for this reason it is well to administer the last injection at bed-time.

The indications for the use of douches are: to cleanse the intravaginal cervix and vagina of morbid secretions; to medicate these surfaces with emollients, etc.; to contract the blood vessels, and to diminish congestion of the cervix and its surroundings in the manner detailed. Vaginal injections sometimes, though not often, create pain or uneasiness. In some cases this cannot be explained; in others, however, as above stated, it is due to the entrance of the fluids in the cervical canal, when this is patulous, or to pressure of the nozzle on a tender ovary or pelvic tumor, or upon a specially sensitive uterus. The pain is generally avoided by altering the position of the nozzle and diminishing the temperature of the water.

Diseases of the Nose, Ear, and Throat.—By its presence water tends to soften or dissolve exudates or tenacious mucus, the removal of which is not only necessary for comfort, but enables other topical remedies to be applied, with increased prospects of success. By its temperature water exerts the same effect upon the inflammatory process of the parts, as is seen elsewhere in the body. Some degree of force is required to disengage morbid secretions of the pharynx and larynx; when these are excessive, water should be thrown by the use of compressed air from a hand-bulb, from a small steam boiler through atomizing tubes, or from a syringe. The compressed air also drives minute drops of water among partially detached epithelial cells, and aids in separating the products of diseased action from the parts to which they are adherent. Copious flushings, with slightly medicated or diluted solutions driven from a domestic syringe, is recommended by J. C. Mulhall. (*Tr. Amer. Laryng. Asso.*, 1889, 118.) This writer uses water as a topical agent, especially in DIPHTHERIA. It should be used every hour, in the waking state, as above indicated. The patient must not be permitted to rest more than three hours without it. Irrigating the surfaces of the pharynx in TONSILLITIS with the ordinary carbonated water (sold under the name of "soda water"), permitting it to flood the throat through the ordinary syphon bottle, has been proposed by S. Johnson. (*Ibid.*, 144.)

A. H. Buckmaster (*N. Y. Med. Jour.*, Jan. 22, 1887) has successfully treated cases of ACUTE SUBMUCOUS LARYNGITIS by douching the larynx with water at 120° F.

After scarification of the inflamed tissues, the serous products are more easily expelled by the use of warm water under compression than in any other way. The remedy is valuable in ŒDEMA of the glottis.

Water, when used very hot, need not be exhibited under compression. Gargles of hot water have long enjoyed a reputation in domestic medicine for TONSILLITIS. Applications to the skin of the region of the larynx are of antiquity in the treatment of CROUP. B. Robinson urges its employment in EPISTAXIS, especially when this exists as a complication of atrophic rhinitis.

The heat of steam is of advantage in local therapy in addition to the mechanical features already alluded to. It acts favorably on the mucous surfaces in DIPHTHERIA. In suppurative TONSILLITIS it favors the formation of pus; its employment is indicated in the same conditions in which moist heat would be used in favoring the formation of an abscess on the periphery of the body.

Ice held in the mouth is useful in ACUTE LARYNGITIS and PHARYNGEAL DIPHTHERIA. (See p. 100.) Cold compress also may be applied to the neck.

C. Seiler recommends pure spring water, notably, the water of Cresson Springs, Pa., as a local remedy in NASAL CATARRH; otherwise, native medicinal waters or waters which are medicated are not treated of in this section.

Diseases of the Eye.—Fizir (*Transactions of Ophthalmological Society*, 1886) claims that hot water gives better results than iced cloths in GONORRHŒAL OPHTHALMIA. He uses hot fomentations for half an hour at a time, every one, two, or three hours, and in some cases the application is continuous by letting hot water trickle from a tube. In OPHTHALMIA NEONATORUM, intermittent hot applications can be much more conveniently applied than can continuous cold. Leiter tubes afford a convenient means of applying dry heat to the eye. In the Heidelberg Ophthalmic Hospital such coils are connected with hot water-pipes extending along the wall of the ward, behind the heads of the beds. Ordinarily, one of the most convenient means of application is the small hot-water rubber-bag.

BATHS.*

By the term bath, in medicine, is implied the employment of water as a remedy by the immersion of all or of large portions of the body. In the instance last named, baths receive the names of the regions to which they are applied, as, for example, *hip-bath* (*sitz-bath*), *foot-bath*, etc. The terms *sponge-bath*, *shower-bath*, and the like, are also in common use. Properly speaking, those last named are not immersions, but are of a like significance, since the bath, to be efficient, must comprise copious flushings of the body surface. The *cold* bath is composed of water at the temperature of 40° to 65° F., the *cool* bath, 65° to 75° F., the *tepid* bath, 85° to 94° F., the *warm* bath, 94° to 98° F., and the *hot* bath, 98° to 112° F.

General Surgery.—*The Cold Bath.*—The cold bath is antipyretic. It rapidly absorbs heat from the body by cooling and moistening a dry, heated skin, thus enabling surface radiation to take place under favorable conditions. At first the respiration rates and the pulse rates are accelerated, but they soon become retarded. A peculiar roughened condition of the skin ("goose flesh") appears, due to the contraction of the erectores pilorum muscles. The cutaneous vessels are constricted. After a cold bath, if the subject be in good health, an agreeable reaction occurs, accompanied by a sense of warmth, the restoration of the vessels to their normal size and renewed bodily and mental vigor. A cold bath when applied to an already weakened system, increases the depression, and there is no reaction.

Cold baths are resorted to, in the main, to reduce the high temperatures, of TYPHOID FEVER and SUNSTROKE. In the disease last named the temperature runs up to 106° and 110° F. If such degrees of body-heat be not rapidly reduced, death is inevitable. The patient should be at once immersed in a cold bath, or the skin be kept constantly wet with cold water. The moment the temperature becomes normal the cold applications are stopped, the patient is wrapped in a blanket and placed in bed in a cool room.

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* For Medicated Baths see Appendix.

The Hot Bath.—The hot bath is, *per contra*, used to raise the temperature of the body. The cutaneous vessels are dilated, the skin becomes reddened, and a tendency to perspiration is favored. These conditions may persist for some time after removal from the bath. When too much blood has been invited to the brain, a hot bath will tend to expel it. The hot bath is especially useful in overcoming a disposition to INSOMNIA. It is also of value in overcoming SPASM, especially spasm of the involuntary muscle fibres constituting the muscular coats of the canals of the viscera. It is often resorted to to overcome COLIC dependent on prolonged muscle contraction in the biliary ducts, ureters, bladder, small intestine, etc.

HERNIAL PROTRUSIONS which have resisted attempts at taxis, as ordinarily regulated, often yield to the repetition of this method, when the patient is immersed in a bath as hot as can be borne for fifteen minutes. A similar procedure is of value in the REDUCTION OF DISLOCATIONS; though the relaxing effect of heat is less evident upon muscles of the voluntary than upon the involuntary set.

Hot hip-baths and foot-baths are in use in domestic practice, as derivatives in PELVIC CONGESTION, and as remedies to invite blood away from the viscera in the first stage of FEVER.

The baths ordinarily employed in diseases of the skin are composed of water alone or containing medicinal substances in solution.

Diseases of the Skin.—The cold and cool baths are employed in the treatment of MILIARIA or "prickly heat." The patient remains in the bath a longer or shorter time according to the heat of the weather, and then on getting out is carefully dried without rubbing, and the skin is dressed with some astringent or sedative powder, as McCall Anderson's camphor powder: ℞. Pulv. camphora, ʒj; Pulv. amyli; Pulv. zinci oxidi, āā ʒss. M.

Lukewarm and moderately hot baths diminish irritability of the peripheral ends of the sensory nerves. For this reason such baths are useful in those skin diseases in which PRURITUS is a prominent symptom. In the simple pruritus of old age or in the pruritus connected with disease of the liver, or in winter pruritus (PRURITUS HIEMALIS), the simple warm bath often is beneficial. The warm or hot bath should usually precede the employment of more decided antipruritic remedies. The addition of indifferent substances, as starch, bran, oat- or corn-meal, serves to soothe the inflamed skin in ECZEMA, particularly where the skin has been broken leaving a moist surface. Here crude water alone sometimes irritates the skin, while the addition of some starchy substance soothes and relieves pain and itching. With a similar end in view, alkalies are added to baths, their soothing effect being probably due to some osmotic action, similar to that which takes place when carbonate of sodium solution is employed as a dressing for burns. In the intense DERMATITIS OF BURNS and in skin affections like PEMPHIGUS, where the patient is more or less flayed, the continuous tepid bath as devised by Hebra, offers a medium in which the patient can live without such anguish as constantly tortures him when exposed to the air, and even with some greater chance for recovery.

Very little true absorption either of water or of substances contained in it takes place in the bath, but a certain amount of imbibition of water and of substances dissolved in it may occur, as far as the superficial layers of the epidermis are concerned. Such imbibition is much favored by warmth, previous washing of the skin with soap, and repeated immersions. The palms and soles appear to absorb more rapidly than other parts of the body. Gases and volatile matters dissolved in water may be absorbed through the skin. Sulphurous acid and free iodine are thus taken into the system, through the skin, in baths, while free carbonic acid is absorbed either not at all or only in minute quantities.

The plain warm-water bath is useful in macerating the epidermis and preparing it for the reception of oleaginous and other preparations. In ICHTHYOSIS great relief is gained by prolonged daily tepid baths, followed by the use of emollient ointments.

The simple warm bath, or the warm bath containing carbonate of sodium, finds its place in the treatment of skin diseases, accompanied by the formation of crusts and scales over a considerable portion of the body. Maceration detaches these masses and prepares the skin for the more direct application of remedies. ECZEMA PUSTULOSUM, ECTHYMA, some of the SYPHILODERMATA, PSORIASIS, and similar diseases, may be treated thus.

The imbibition of water and watery solutions by the superficial layers of the epidermis is taken advantage of in the treatment of PARASITIC DISEASES, particularly SCABIES. Here the medicated water does certainly penetrate far enough to destroy the itch insect and its ova, and no further penetration is needed.

The employment of vapor baths to facilitate the penetration of medicinal substances, is exemplified in the treatment of SYPHILODERMATA by the mercurial vapor bath. (See Appendix.) Here the body, immersed in hot, watery vapor until free perspiration takes place, is in a fit condition to absorb the mercurial vapor disengaged simultaneously.

ICE.

Ice is refrigerant and analgesic. It constricts the calibre of small vessels, and thus acts as a hæmostatic, antisecretant, and antiphlogistic.

Diseases of the Mouth, Throat, Etc.—Pieces of ice held in the mouth allays the sensation of thirst. Small lumps can be slipped between the lips of a sleeping infant, in ACUTE ANGINA, and the little patient be kept comfortable by the inflamed structure being thus bathed with cold water. HEMORRHAGES FROM THE MOUTH, THROAT, AND NOSE, and even from the LUNGS, are indirectly controlled by allowing pieces of ice to dissolve in the mouth. Cold, wet compresses are useful applications to be made to the skin of the neck, where disposition to recurrent CATARRHAL PHARYNGITIS is marked.

Opinion is quite uniform as to the effect of prolonged use of cold in ACUTE EDEMA OF THE UVULA. Thus, when in the course of treatment with the galvano-cautery, such edema is sometimes developed, a piece of ice held in the mouth checks the condition more rapidly than is possible by any other means; in like manner in threatened EDEMA OF THE LARYNX, cold applications over the larynx are indicated; in this connection Leiter's coil may be named. The use of this apparatus is warmly recommended by W. E. Casselberry. Uniform cold in the early stage of DIPHTHERIA would appear to be indicated to arrest the development of the bacteria. Samuel Johnston approves of the persistent use of ice applied in this stage of the disease.

Diseases of the Eye.—The local application of cold, by contracting the walls of the blood-vessels and diminishing nervous irritability, is a powerful and valuable agent in the treatment of ACUTE INFLAMMATIONS OF THE EYE. It is most useful in traumatic cases and in high grades of CONJUNCTIVITIS, notably the gonorrhœal form. It may be applied dry, by means of small ice bags or by cold water being passed through coils of metallic or rubber tubes; but wet applications are more convenient and generally efficient. The simplest apparatus consists of a bowl of iced water, or, better, a lump of ice, by the patient's side, and some pledgets of lint or linen. The latter should not be folded more than once, and should be changed every few minutes, as, if left on too long, particularly if their thickness prevents rapid evaporation from the linen fold, the surface next the eye becomes warm and an alternation of heat and cold is produced, which may do more harm than good. The application should be continuous, since vascular reaction follows the removal of the cold. Care should be taken not to continue this treatment too long. The sensations of the patient are generally a pretty safe guide, and it is not well to insist upon a continuance of the application when it ceases to be agreeable. As a rule, cold should not be used when there is a tendency to slough.

(For a few additional references to ice, see *Aqua*, p. 92.)

AQUA AMMONIÆ, U. S. Water of Ammonia.

"An aqueous solution of ammonia, containing ten per cent., by weight, of the gas." (U. S. P.) Two strengths of ammonia water are official. The one named above, containing ten per cent., and the *aqua ammoniæ fortior*, containing twenty-eight per cent., by weight, of the gas. Both are solutions of gaseous ammonia in water.

The *Ammonia Liniment* (linimentum ammoniæ, U. S. P.), is prepared by taking thirty parts of the water of ammonia and seventy parts of cotton-seed oil, and mixing them. A liniment prepared by some pharmacists is made by substituting lard oil for the cotton-seed oil.

Aqua ammoniæ is stimulant and vesicant.

Diseases of the Skin.—The stronger solution goes to form the vesicating *ammoniacal ointment of Gondret*. ℞. Adipis, pts. xxxij; Ol. amygdalæ dulcis, pts. ij. Melt by a gentle heat and pour into a wide-mouthed bottle, then add aqua ammoniæ fortior (25°), pts. xvij. Mix, with agitation, until cold. Aqua ammoniæ is chiefly employed as a constituent of hair lotions in ALOPECIA PREMATURA. The vesicating ammoniacal ointment might be employed with advantage in ALOPECIA AREATA. It is also employed as a constituent of some of the stimulating liniments employed in the treatment of CHILBLAINS.

AQUA CHLORI. Chlorine Water.

"An aqueous solution of chlorine, containing at least four-tenths per cent. of the gas." (U. S. P.)

Chlorine water is germicidal and deodorant.

General Surgery.—Chlorine water was formerly much used as a dressing in GANGRENOUS OR SLOUGHING WOUNDS, but it has been largely supplanted by other antiseptics.

Diseases of the Mouth.—Chlorine water may be used as a gargle and mouth-wash, in strength of 1 to 8 parts of water, in APHTHOUS STOMATITIS, etc.

Diseases of the Eye.—Sattler, in his experiments with the micrococcus taken from the lachrymal canal (*Annal. d' Oculist*, 1884, p. 164), found that chlorine water surpassed all other antiseptics. Its unstable character, however, would prevent it from being a convenient therapeutical agent, even if it were not too irritating for application to the eye.

AQUA LAURO-CERASI. Cherry-laurel Water.

Cherry laurel water is made by distilling water from the finely chopped and bruised leaves of the *Cherry-laurel*. It is official in the Ph. Br. It contains one-tenth of one per cent. of absolute hydrocyanic acid. It resembles water in appearance, but has the odor of hydrocyanic acid,—the odor common to wet bitter almonds, peach kernels, cherry-laurel leaves, etc.

Diseases of the Ear.—Cherry-laurel water is a favorite prescription in Germany, for OTALGIA and, combined with tincture of iodine, as an application to DIFFUSE INFLAMMATION OF THE AURICLE.

ARGENTI HYPOSULPHIS. Hyposulphite of Silver.

Hyposulphite of silver is a stimulant and alterative.

Diseases of the Throat.—A union of hyposulphite of silver with hyposulphite of sodium is recommended by E. Watson ("Topical Medication of the Larynx," 1854, 35) in place of the nitrate of silver in the treatment of inflammation of the throat. While weaker than the salt last named he claims that it is more agreeable to the taste, and does not stain.

ARGENTI NITRAS. Nitrate of Silver.

Lunar Caustic is pure nitrate of silver moulded into appropriate form. Diluted nitrate of silver ("mitigated stick"), official in the U. S. P., is composed of equal weights of nitrate of silver and nitrate of potassium fused together and moulded.

"Nitrate of silver is soluble in eight-tenths part of water and in twenty-six parts of alcohol at 15° C. (59° F.)" U. S. P. It should be kept in dark amber-colored vials, since exposure to light reduces it to the black oxide of silver. A like reduction takes place when solutions of nitrate of silver are brought in contact with animal tissues or vegetable fabrics. The stains of the oxide of silver can be removed by mopping the spots with a solution of cyanide of potassium, or one of one part each of bi-chloride of mercury, and of chloride of ammonium in ten parts of water. When the black spots discolor the skin they can be removed by touching them with the tincture of iodine, and washing away the iodide of silver thereby formed with a solution of caustic potassa or water of ammonia.

Nitrate of silver is incompatible with so many substances that when solutions of it are required they should be made with distilled water, as the chlorides in ordinary water, however pure, will otherwise precipitate part or all of it from solution. Excessive action of nitrate of silver on animal tissues can be controlled by sopping them with a solution of common salt.

Nitrate of silver is caustic, excitant, astringent, and hæmostatic. Strengths of nitrate of silver sufficient to prove astringent are also apt to be irritative. Thus, when used on mucous surfaces, the agent is liable to excite the mucous glands, if not increase the inflammation. Under other conditions the irritating quality of the drug acts to advantage, and it is often selected when an excitant, at the same time astringent, effect is desired. Nitrate of silver is a weak caustic on the most delicate tissues, but is a futile one on tough, resistant tissues. It is an astringent and hæmostatic through the direct constricting effect it exerts on the calibres of the smaller vessels, and in the pressure made on them by the hygroscopic albuminate created by the salt.

General Surgery.—Nitrate of silver, in stick, crystal, or solution, is in general use. As a stimulant application to CHRONIC ULCERS it has long been held in high repute. Its successful employment, however, depends largely on the manner in which it is applied and the strength in which it is used.

In treating ulcers it is used in the form of the stick (or crayon) with which the granulating surface is gently penciled over. If a destructive action is desired, to remove EXUBERANT or FUNGOUS GRANULATIONS, the crayon must be carried deeply. Such an application will frequently cause the granulations to bleed freely, but the bleeding soon ceases on the removal of the crayon. Nitrate of silver is especially valuable as a stimulant for CHRONIC LEG ULCERS and for CHRONIC ULCERS following burns. Care must be exercised in applying it to the ulcers when cicatrization has begun, not to encroach on the delicate pink line which surrounds and lies between the granulations and the skin, since this line answers to the layer of the newly formed epithelial cells. Any contact here with the agent will cause a slight superficial slough and retard the cicatrizing process. When the solid stick or a strong solution comes in contact with fresh granulations, the part touched becomes whitened and a thin film of albuminate of silver is formed. For convenient manipulating of the crayon, it is best placed in a porte-caustique made of hard rubber, or inserted in the end of a quill. It should never be placed in the metallic porte-caustiques that are sold in the shops, as they soon become corroded.

Solutions of nitrate of silver can be used in strengths from ten to sixty grains to the fluidounce as a stimulating application to ULCERS, BURNS, and WOUNDS. It is most conveniently applied with a camel's-hair pencil, or a swab made of absorbent cotton on the end of a stick. It is preferable to pour out the amount required in a small vessel, thus preventing any tendency to contaminate the sensitive solution by a soiled brush or swab. We have often found it of service in a weak solution (from two to five grains to the ounce of water) painted over the delicate granulations following large BURNS, which have a great tendency to bleed on the removal of dressings. It appears to harden the granulations and control hypersensitiveness and to promote cicatrization.

In small punctured WOUNDS such as are caused by the bite of a dog, the application of the nitrate of silver often does harm by the premature formation of a crust which prevents the escape of blood or serum. The indication to cauterize the wound usually sought for in making the application in the cases of suspected RABIES is imperfectly met, since the caustic effect of silver is insufficient to destroy the infected tissue. Brunton ("Pharm., Therap. and Mat. Med.," Am. Ed., 1885, 349) cites the case of a boy dying of hydrophobia in six weeks after a bite which, five minutes after its infliction, had been thoroughly cauterized with nitrate of silver.

Nitrate of silver is used in a variety of ways on cutaneous surfaces. Higginbottom strongly recommends its local application in ERYSIPELAS. He states that no agent is so safe or efficacious. Before applying it, the parts should be thoroughly cleansed with soap and water, then with simple water, and afterward dried. Then a solution of twenty grains to the ounce should be painted over the parts two or three times, and beyond it on the healthy skin to the extent of two or three inches. It is important that the skin be thoroughly clean, as any particle of soap left will decompose the solution. In twelve hours it will be seen whether the solution has been well applied. If any of the inflamed surfaces be found unaffected, it must be reapplied. Stronger solutions (160 grains to the ounce) may be painted over the affected parts and a little beyond it, or a line drawn around them a little outside the borders, with the solid stick. The alteration produced in the tissues underneath this line is said to prevent the extension of the inflammation beyond the limit thus formed (Brunton *loc. cit.*, p. 576). Stükovenkoff experimented upon forty-two patients with the nitrate of silver treatment and concluded that it shortened the duration of the disease one-half. Polotebnow repeated these experiments on sixty more cases but with unfavorable results. The nitrate of silver, he asserts, can neither stop the erysipelatous process in the skin, reduce the fever, prevent renal complications nor shorten the period of albuminuria. Our own impression is that this remedy is of limited value.

As a prophylactic in ONYCHIA and FELON, nitrate of silver, if applied early by painting over the finger several times a solution of twenty to thirty grains to the ounce, is often used; but we have found it a less satisfactory remedy than is tincture of iodine.

BED-SORES may be prevented by painting the threatened but unbroken skin, as soon as it becomes red, with a solution of nitrate of silver ten grains to the ounce. (See *Emplastrum Plumbi*).

Mason has followed with much success the plan of applying a sharp pointed stick of nitrate of silver to the base or under surface of the granulations of INGROWING TOE-NAIL; after doing this he carefully inserts a small piece of lint soaked in black wash, and envelops the entire toe in a water dressing. Agnew advises the application of a fifty per cent. crayon of nitrate of silver to the ulcer at the bottom of an obstinate FISSURED NIPPLE; the part should be thoroughly cleansed, care being taken to carry the agent into every crevice, and afterward to wash the parts with a little milk or water, when a few dressings of oxide of zinc ointment will usually complete the cure.

In RANULA in children it is sometimes difficult to dissect out the sac.

In such cases the anterior surface may be snipped away with a pair of scissors and the remaining inner surface may be wiped over with a solid stick of nitrate of silver, which will often destroy the cyst.

In the treatment of EPIDIDYMITIS, if no amelioration is experienced after the lapse of thirty-six hours, the scrotum should be blistered by drawing a number of lines with nitrate of silver longitudinally over its posterior surface. In twenty-four hours each cauterized tract will present a vesicated surface, the pain of which can be materially lessened by a hot water dressing.

BALANO-POSTHITIS is at times associated with a contracted prepuce. This condition may be mistaken for gonorrhœa. If there be little ardor urinæ, with much preputial swelling and little tendency to erections, a balano-posthitis may be diagnosed. An injection of nitrate of silver (twenty grains to the ounce), thrown in with a syringe between the glans penis and the prepuce, after having previously washed out all the purulent and sebaceous matter with warm water, will promptly cure the inflammation. If the surfaces are excoriated and can be reached, Bumstead advises penciling the part lightly with the solid stick of nitrate of silver. As an application to the urethra in GONORRHŒA, nitrate of silver has long been highly recommended by many surgeons. For the abortive treatment of the early stages, it was commended by Debeney, of France, and Carmichael, of England, in the strength of ten to twenty grains to the ounce. In our opinion, it is applicable only when the disease is limited to the fossa navicularis. In attempting to abort GONORRHŒA, the urethra is previously cleansed with plain water, and then the solution is thrown in from a rubber syringe, care being taken to constrict the canal between the thumb and finger, thus shutting off the healthy from the inflamed mucous membrane. The effect of the injections is manifest in a few hours; the discharge becomes copious and purulent, and considerable scalding is felt on passing water. In the course of forty-eight hours, the discharge grows thin and watery, and is likely to be tinged with blood. It is now time to stop the injections, and to wait for a few days, to see how much good has been accomplished. If this line of treatment meets with success, the discharge will gradually cease, and will stop in from three to five days. It is usually not wise to resort to this form of treatment save in exceptional cases, where the patient is willing to submit to the additional pain, risk and inconvenience, which may be incurred. This method often leads to the formation of stricture, gangrenous inflammation, prostatitis, orchitis, etc. The abortive method by the milder injection (one-fifteenth of a grain to the ounce), with injections once in every two or three hours, is much more to be commended and less painful, and the results will, as a rule, be more satisfactory. In all applications of nitrate of silver to the urethra, care should be exercised that the parts be as clean and free from any deposit as possible, owing to the ease with which the solution may become decomposed.

Much has been written about the injection treatment of ACUTE GONORRHŒA by nitrate of silver, by Friedheim and Neilson. The treatment with the nitrate, in solutions of 1–4000 (one grain to nine ounces), and never stronger than 1–2000 (one grain to four ounces), was instituted early in every instance. The immediate effect was to increase the purulent character of the discharge, a result which, in the course of four days, was followed by a marked change in the secretion, which then became thinner, whiter, less in amount, and was found to contain more epithelium. The influence upon the gonococci is said to have been pronounced by the time this change in the character of the discharge was manifest, and they shortly afterwards disappeared completely. According to Neisser's experience, nitrate of silver stands at the head of the list of remedies for GONORRHŒA, bichloride of mercury taking a second place. Not only was the silver found to produce anti-bacterial results, and to decrease the inflammatory phenomena, but it appeared to exercise an especial influence in preventing the complication of EPIDIDYMITIS. After a fair trial of the silver, if the discharge continues, the strength of the injection may be increased to one grain to four ounces, or it may become necessary to alternate with sulphate of zinc, or some other simple astringent.

Much can be said of the value of silver in CHRONIC GLEET when this depends upon an ulcerated spot in the deep portion of the urethra, which can be seen by the use of Leiter's panelectroscope. In such a case either a strong solution (one drachm to one ounce) or the solid stick may be carried down through the instrument and applied directly to the spot. A few applications in this manner are usually followed by satisfactory results. The same treatment in CHRONIC PROSTATORRHŒA, due to the inflammation having invaded the prostatic ducts, will usually be of service and give relief, after injections to the deep urethra have failed. In delicate applications of this sort the same result may be obtained by the use of a silver probe, tipped with nitric acid and applied to the part.

In HÆMATURIA and CHRONIC CYSTITIS Sir Henry Thompson has found that washing out the bladder with a solution of one-fourth of a grain to one ounce is one of the most valuable of remedies. In INCONTINENCE OF URINE in children, especially in confirmed cases, in which the children have arrived at the age of puberty, an application of two grains to the ounce to the prostatic urethra has been found serviceable after other means have failed.

In SPERMATORRHŒA E. Home was the first to recommend the use of nitrate of silver in strong solution, twenty grains to the ounce. It is recommended to use it by means of an applicator.

The solid stick is sometimes applied with great advantage to INDOLENT BUBOES, all the sinuses being wiped out with a well-pointed stick, or touched with a strong solution, sixty grains to the ounce, and then packed with iodoform gauze.

In SUBACUTE and CHRONIC DYSENTERY the treatment by injections of silver consists, in the main, in thoroughly cleansing the bowel with large enemata of warm water, and then injecting a solution of ten to twenty grains to the pint of water, by means of a long, flexible tube carried well up and into the colon. Great care is required in inserting the tube, in order not to wound or perforate the inflamed and delicate mucous membrane. The injection should be made from a reservoir of glass or a rubber bag, held at an elevation of four feet above the patient, who should be placed in the recumbent position, on the right side, with the hips elevated. This will be more apt to insure the passage of the solution. In order to insure its reaching as high a point as possible, the fluid must pass slowly, as this will enable the colon to gradually accommodate itself to its presence. With care, from three to four quarts may be injected. It is wise to begin with a weaker solution than that named above, but this may be gradually increased in strength up to a drachm to the pint, as recommended by H. C. Wood. When the ulcerations are lower down in the rectum, the same effect can be attained by means of an ordinary rubber syringe. In ulcerations just within the sphincter, an application of the solid stick, or a strong solution applied on cotton, or through a speculum, will often be found an efficient means of treatment.

Diseases of the Skin.—Nitrate of silver applied to the skin in a solid form acts as a mild escharotic. It causes exfoliation of the epidermis, and even a slough. Applied to the skin which has been previously deprived of its epidermis, its action is stronger. It coagulates the albumen of the tissues and gives rise to a dry slough, usually separating after a time by exfoliation.

In strong solutions, nitrate of silver acts with almost as much power as in the solid form, but as the solution is diluted the escharotic action of the application gives place to an astringent effect, with constriction of the capillary blood vessels.

The solid stick of nitrate of silver is used in Germany as an application in LUPUS VULGARIS. The diseased tissue is thoroughly scraped with a sharp spoon and then the nitrate of silver stick is bored into the diseased tissue and rubbed over the surface at all points.

The solid stick is also employed to cauterize the base of WARTS after their removal by the sharp spoon or other means, and also to aid in the destruction of MILIA, SEBACEOUS CYSTS and MOLLUSCUM EPITHELIALE or CONTAGIOSUM. As an escharotic to destroy WARTY GROWTHS, nitrate of silver is inferior to other caustics, as acetic and chloracetic acids, lactic acid, nitric acid, caustic potassa, etc.; but its action is sufficient when only a superficial effect is desired.

The weaker solutions of nitrate of silver are employed for their stimulant effect, or to excite mild substitutive inflammation. In fact, even the stronger solutions, or the solid stick, may be used for this purpose.

In CHRONIC ECZEMA, single patches, stubborn to ordinary treatment, may sometimes be made to take on healthy action by painting their surface with solution of ten to thirty grains to the ounce of water.

In other cases a saturated solution may be employed, when the skin is thick and hard, or even the solid stick may be lightly rubbed over the surface, care being taken to prevent over-action by the use of wet compresses or sedative lotions if required. FISSURED ECZEMA, whether in the form of cracked lips, or fissures in the neighborhood of the anus, in the ends of the fingers, or elsewhere, are best treated by cauterization with a sharp point of solid nitrate of silver. This is momentarily painful and should be followed by the application of a soothing ointment or lotion. In ECZEMA OF THE SCROTUM a solution of ten to thirty grains nitrate of silver in an ounce of spiritus ætheris nitrosi, painted on in one or more coats, often relieves the patient and aids the cure. If it leaves the skin too stiff, a soothing ointment may afterwards be rubbed in.

In SUPERFICIAL INFLAMMATIONS, other than erysipelas, H. C. Wood has used the concentrated solution, 160 grains to the ounce, to advantage. ("Therapeutics," 5th ed., 1883, p. 53).

Diseases of the Ear, Throat and Nose.—M. J. Rossbach (*Berliner Wochenschrift*, May 15, 1882) found that a four per cent. solution of nitrate of silver painted upon the mucous membrane of the trachea of a healthy living animal, instantly covered the parts a deep white so that it was impossible to see the blood vessels. In a rabbit in which the lining of the trachea was already inflamed, the same result ensued. By repeated drying of the affected spot it was seen, after a little, that minute vessels appeared through the white circumscribed deposit. Upon the web of a frog's foot nitrate of silver caused a very decided narrowing of the blood vessels, but Rossbach was not able to discern any such change in the trachea. It is probable, however, that the vessels contract and that this result is as conspicuous as is the coagulation of the albumen in the tissue; the amount of mucus is diminished. In the larynx the effect is the same as in the trachea. In the nose and naso-pharynx the local effect of nitrate of silver is much more irritative; instead of being followed by diminution of secretion the amount of outflow of mucus is increased. Nitrate of silver also aids in arresting bleeding, and is an excitant to absorption of the products of inflammation.

Varying strengths of nitrate of silver are employed. Those usually named are one, two, five, ten, twenty, forty, sixty, eighty and one hundred grains, or a saturated solution which is represented by four hundred grains to the ounce of water. Any solution of a strength above forty grains is often spoken of as a stronger or concentrated solution. Weak solutions convert transparent mucus into a white, less tenacious fluid, while stimulating the membranes on which the secretion rests. The stronger solutions destroy the epithelium. The coagulum is soon detached, thus presenting advantages over more adherent forms caused by application of solution of the salts of iron. The caustic impression of nitrate of silver is superficial; concentrated solutions coagulate the albumen in the submucous tissue to a slight depth. The eschar is at first white, then gray. All solutions are stable only when kept away from the light by being placed (small quantities at a time) in a bottle covered with blue paper. The action of the light is to decompose the nitrate and to substitute for it the oxide of silver, which is said to be comparatively useless.

Perhaps there is no remedy in the entire list of local therapeutics concerning which a greater variety of opinion has been expressed than is the agent now under consideration. It is a favorite remedy of many practitioners in the local treatment of the nose and larynx; rarely used by some, while discarded by others. Doubtless, the extensive range of drugs which have been introduced of late years for local medication have greatly limited the value of this time honored agent.

In using the pure salt the following method is recommended: A small quantity is melted in a platinum crucible or test-tube. The warm roughened end of a platinum or aluminium probe is inserted in the molten mass, thereby causing a small quantity to firmly adhere. Such an applicator can be used without danger of any portion of the solid becoming detached. A saturated solution is readily obtained (when a small quantity only is needed) by rubbing a piece of a sponge on a crystal of the salt, by such means the dangers arising from the use of the brittle fused stick is avoided. J. Solis Cohen refers to a case of fatal laryngitis caused by dropping a piece of nitrate of silver into the larynx. This writer commends for application to the pharynx what he terms the "caustic pencil," which is a safe and admirable method of applying nitrate of silver. The pencil is in the form of a lead pencil, the nitrate of silver being enclosed between two pieces of wood, after the manner of the stick of plumbago.

The cautery effect of the solid stick is comparatively weak. It is not powerful enough to destroy aural polypi, or the coarse granulations on an old ulcerated surface. It is admirably adapted, however, to coagulate the albumen on the surface of an ulcerated patch, giving rest to the parts, and, by creating a protectant, lessens pain and diminishes congestion and inflammation. It is, thus, chiefly used in ULCERATIONS OF THE LARYNX, especially of the parts defining the aperture, including the epiglottis. It has little or no value in removing recent, infective exudates, though Gonzales Domingo (*Gaceta Médica Catalana*, Barcelona, Sept., 1886) claims that it is useful in DIPHTHERIA. In closing superficial FISSURES of the lips and tongue, and in obliterating congeries of small vessels in limited area by coagulating the connective tissue between them, the solid stick is in high repute, and often takes the place of the knife in removing blood from the affected spot. Keene recommends it in this way as a destructant of AURAL FURUNCLE when seen in the first stage.

As a hæmostatic it is of use only when the blood escapes from a small abrasion or ulcer. Under such conditions it acts promptly. Thus it often checks an EPISTAXIS. Since the albuminate which stops a bleeding vessel is thin and is soon absorbed, nitrate of silver cannot take rank as a hæmostatic with those styptics which "tan" the connective tissue. It may be applied fused on the end of a probe, or a silver probe may be dipped in nitric acid. Care should be exercised in using fused nitrate of silver on the vocal cords; cicatricial nodules are described as following its use, especially when large areas are covered (C. E. Sajous, *Trans. Laryng. Ass'n*, 1878). Reflex spasm has been noted as a result, which may be now largely avoided by previously sponging the parts with a ten per cent. solution of cocaine.

When the mitigated stick in any fixed strength is converted into a powder by scraping with a sharp knife, a convenient form is obtained for insufflation. More commonly, however, powders are prepared by mixing the fused nitrate of silver, which has been triturated, with starch, lycopodium, or sugar of milk. Herzog ("Der acute und chronische nasenrachen Catarrh," etc.), employs boric acid as the agent for dilution, and claims good results in the treatment of ACUTE and CHRONIC INFLAMMATION OF THE NASO-PHARYNX.

"The introduction into the glottis with a sponge saturated with the crystals of nitrate of silver, of the strength of forty, fifty, or even sixty grains of the salt to the ounce of water, does not produce, ordinarily, as much disturbance as the accidental imbibition into this cavity of a few drops of tea or pure water."— H. Green, "*A Treatise on the Diseases of the Air-passages*," etc., 1858, p. xvi. While this is undoubtedly true, nitrate of silver, in almost any strength of solution, applied to the interior of the larynx, *may* cause violent spasm of the muscle of the glottis, and the physician should never be off his guard with respect to this possibility. If spasm should occur, the patient should be enjoined to keep perfectly calm, and attempt to draw air into the lungs. Should this fail, a few drops of nitrite of amyl should be placed on a handkerchief, and the patient again urged to make another attempt at an inhalation.

In OTORRHŒA, nitrate of silver is employed, in the strengths of one grain to ten grains to the ounce. It is instilled in the external meatus, in PERFORATION OF THE TYMPANUM, or carried by means of Blake's syringe directly into the middle ear through the perforation in the tympanic membrane. A. H. Buck (*Trans. Otological Soc.*, 1873, p. 72) believes "that nitrate of silver should rank as one of the safest reagents to employ in stimulating the tympanic mucous membrane to healthy action."

Nevertheless, degrees of strengths which are appropriate for one part of the affected mucous surface may over-excite an adjacent one. In addition, the tenacious mucus may be converted into a tough coagulum and disguise the appearance of the underlying parts. As a rule, a quantity of the mitigated stick of desired strength should be scraped so as to form a powder, to be applied by a probe or cotton-carrier to the selected spot. For ACUTE INFLAMMATION OF THE EXTERNAL MEATUS, weak solutions, from one to two grains to the ounce, are efficient (Kramer). In MOIST ECZEMA, from ten to twenty grains to the ounce are well borne (W. H. Dalby). In the coarse fibroid granulations which sometimes surround the orifice in a neglected AURAL CATARRH, with purulent discharge through the tympanic membrane, a solution of thirty to sixty grains to the ounce can be used with advantage. In the condition named, the solution should be carefully mopped on the growths, and the meatus subsequently flooded with a weak sodium chloride solution. Nitrate of silver is less frequently used in the Eustachian tube, though Kirchner recommends a weak solution in CHRONIC INFLAMMATION OF THE LINING MEMBRANE. Forty grains, in solution, is claimed by O. D. Pomeroy (*Med. Record*, 1871, p. 31) to be an efficient application to POLYPUS of the middle ear.

Perhaps nitrate of silver is used more frequently in this country for the treatment of FOLLICULAR CHRONIC PHARYNGITIS than is any other agent. Its value has been tested for so many years that its reputation may be considered well established. After the mucus has been removed the agent is, as a rule, applied in solutions, the strength varying from forty to sixty grains. The hypertrophied masses are to be carefully sought for and each touched with the medicine carried to the affected spots on the end of a cotton carrier, sponge, or other proper instrument. The mucus is coagulated and the submucous infiltrations are actively absorbed. Mackenzie advises that in GRANULAR PHARYNGITIS the separate nodules be incised and the solid stick be carried to the interior. On the whole, the agent is less efficacious in the naso-pharynx. The parts are here more easily excited by nitrate of silver, than is the case in the oro-pharnyx—a fact doubtless owing to the delicate layer of epithelium on the upper surface of the velum as compared to that on the under surface or in the oropharynx. Sixty grains to the ounce has been employed with good effect in ERYSIPELAS OF THE THROAT and PHARYNGEAL SYPHILIS. Five to ten grains to the ounce is a useful lotion for injection in ŒSOPHAGEAL SPASM. According to M. Mackenzie "three or four injections made on alternate days will effect a cure or relieve the parts so much that bougies can be subsequently used."

A weak ointment of nitrate of silver mixed with cosmoline smeared on a flexible bougie is recommended by J. Solis Cohen, for INFLAMMATION OF THE ŒSOPHAGUS.

Formerly nitrate of silver in concentrated solution was used in the treatment of ADENOID GROWTHS in the naso-pharynx. The suffering caused sometimes by this application was extreme. Such practice is now generally abandoned. For the treatment of MUCOUS PATCHES of the pharynx a solution of sixty grains to the ounce makes a desirable application. In the mouth the use of nitrate of silver is limited to a few conditions. The solid stick or a concentrated solution lightly applied to ULCERATED APHTHOUS or SPECIFIC MUCOUS PATCHES will generally be followed by a prompt cure. The treatment is unsuitable to infancy. The inflamed tags of gum tissue about the cavity of a recently extracted tooth are successfully treated by the same means. On the tonsils nitrate of silver is of marked value in a strength of twenty grains to an ounce carefully applied to each recess of depression. In TONSILLAR HYPERTROPHY and DIPHTHERIA the agent is worse than useless. As a cautery it is ineffective. The action of fused crystals upon the crypts is that of an astringent, not that of a caustic. Indeed, it is often not even astringent, but excitant.

In ACUTE CORYZA a lotion or powder in the strength of two grains to the ounce may be thrown in the nose. But excessive sneezing sometimes follows its use. In the PURULENT CATARRH of children the remedy can be employed with increased probability of success. Tags of inflamed tissue, bright red in color and exceedingly vascular, created by the action of the saw in intra-nasal surgery, are often the source of secondary hemorrhage; they should be carefully sought for by about the fourth or fifth day after the operation and touched with the solid nitrate of silver or its saturated solution. The preparations of iron appear to have little effect upon such formations. A. Nélaton ("Pathologie Chirurgicale," Paris, 2d ed., 1874, vol. III, p. 748) uses nitrate of silver in the local treatment of NASAL POLYPUS. The use of this agent in the treatment of CHRONIC NASAL CATARRH does not appear to be uniformly endorsed. C. Seiler asserts that it should never be used; but Michel, Schrötter, and Niemeyer as well as numerous other writers, claim its value. It is probable that German physicians may find a less highly developed neurotic disposition to exist among their patients than is the case with practitioners in America. Be this as it may, the agent is apt to excite the parts if introduced in the nose in the proportions demanded in the successful treatment of CHRONIC NASAL CATARRH. With caution, however, the nitrate of silver treatment may be successfully essayed if the mucous membrane of the nose is measurably free from erectile tissue. Thus, it is of value on the middle turbinated bone, but less efficient on the inferior turbinated bone; it is distinctly serviceable in OZÆNA, but irritating in diseases which are accompanied with vaso-motor excitement. Again, in inflammatory states, accompanied with infiltration of the septum and the middle turbinated bone (as in the late stages of SECONDARY SYPHILIS or TERTIARY OSTITIS of the nasal passages), no agent is comparable to the nitrate of silver; the single precaution to be taken in its use is not to cover too large a surface at one sitting, lest an artificial coryza ensue. To neutralize the action of the drug, the parts should be flushed with a solution of sodium chloride. Careless use of the nitrate of silver on the interior of the nose may be followed by inflammation which may extend into the pharynx, but the same danger attends any local agent, and is especially true of the galvano-cautery, which agent some authors are inclined to laud at the expense of the nitrate of silver. To apply nitrate of silver on small areas of surface with precision, it is recommended to melt the fused stick. A probe of convenient size is covered with the fluid and carried directly to the parts, or a small piece of cotton may be wrapped around the end of a delicate cotton carrier and dipped in the saturated solution.

"Nitrate of silver in solutions varying in strength from one-half grain to sixty grains to the ounce has long been a standard remedy for the treatment of CHRONIC LARYNGITIS, especially in forms where inflammation exists on the vocal cords." (Horace Green, "On Bronchitis," New York, 1846.) Of the wide range of distinctions indicated by these varying strengths it is impossible here to speak. As a rule, weaker preparations suffice, but in the hands of skillful practitioners the stronger ones are not only useful but appear occasionally to be demanded. It is most efficient in cases accompanied by secretion. In DRY LARYNGITIS, chloride of zinc (*q.v.*) is the better drug. In using silver an alkali should be used first, to remove the mucus. Not more than a drop or two drops of the solution should be used at a time; these may be soaked up on a piece of absorbent cotton or sponge (held in a sponge-holder), and carried directly to the affected surfaces. The application may be made twice or three times a week. Care should be taken to avoid spasm of the larynx, but if the patient shows any inclination to such spasm occurring, astringents should not be used until a local application of cocaine has first been made on the laryngeal mucous membrane.

According to the peculiarities of individuals, spasms may occur on the employment of the agent in almost any strength, but the likelihood of its occurrence is in proportion to the strength of the preparation. Some observers do not employ cotton in making such applications, believing that a sponge or brush is to be preferred. A fear is expressed by these writers that small threads may become detached and distressing cough ensue. With care, however, such accidents can be avoided. The objection to the brush appears to be that no substance once touching the affected region should be used a second time; it would be costly to have brushes in numbers, while the cotton is inexpensive. The sponge is a much harsher substance than either the brush or cotton, and used in small pieces may often prove, in the treatment of the larnyx in young persons, rather difficult to manage.

C. Seiler claims that the strong solutions of nitrate of silver, say sixty grains to the ounce, have an anæsthetic effect, and are better borne than weak ones. We have had no experience in such effects, but would suggest they should be used over small surfaces at a time, and be neutralized with sodium chloride; in some instances we have used stronger solutions to the walls of the pharynx; great pain has followed.

S. Solis-Cohen is of the opinion that after laryngitis has in great part subsided, there may remain irregular pinky strips on the vocal bands, or a slight congestion of the parts, which prevents the patient from resuming, with comfort, full use of the voice. Cohen asserts this condition is an indication for the topical use of a weak solution of nitrate of silver. He employs ten grains to the ounce, and employs the agent by sponge, or cotton wad, or brush, directly to the affected parts, at intervals of two or three days. Patients becoming accustomed to the method, may have the strength increased to those as strong as forty to sixty grains to the ounce. The stronger applications may be made at longer intervals, say one to two or three weeks (Trans. Amer. Laryng. Ass'n, 1889).

As high as eighty grains to the ounce has been used by Gibbs in the treatment of ERYSIPELAS OF THE LARYNX. Nitrate of silver, in "strong solution," is in repute (Horace Green, "Polypi of Larynx and Œdema of the Glottis," 1852) in ŒDEMA OF THE LARYNX, but is inferior in efficacy to scarification. As a hæmostatic in HEMORRHAGE from the vocal cords, nitrate of silver (thirty to forty grains to the ounce) is recommended by C. E. Bean (*N. Y. Med. Jour.*, Sept. 4, 1887). In spraying the larynx or throat with nitrate of silver, it is necessary to protect the face and teeth from the stains. The drug is now little used in the local treatment of LARYNGEAL PHTHISIS. Strong solutions have been used for the purpose, however, namely, from sixty to one hundred and twenty grains to the ounce. Techernoff (*St. Olga Hos. Rep.*, 1888) uses a two per cent. solution in SYPHILITIC LARYNGITIS.

A twelve per cent. solution is one of the older methods in the treatment of MEMBRANOUS CROUP.

Before the days of laryngoscopy a mixture of nitrate of silver and lycopodium was inhaled from a small receiver placed far back into the pharynx. The strength of the powder varied from one per cent. to twelve per cent.

Inhalations of the nascent forms of nitrate of silver have been recommended by Bidenkap in the treatment of CHRONIC INFLAMMATION OF THE LINING MEMBRANE OF THE RESPIRATORY TRACT. A writer in the *Journal of Laryngology and Rhinology*, 1887, page 322, believes that this method should be restricted to the treatment of CHRONIC BRONCHITIS and EMPHYSEMA and recommends the following plan: One part of nitrate of silver to three parts of ammonic nitrate are placed in a small crucible or evaporating dish, the whole heated by a spirit lamp. Each inhalation should last no longer than from thirty to forty-five minutes. The atmosphere of the room being suffused with minute portions of nitrate of silver capable of discoloring all white textures they light upon, care should be taken to protect clothing, etc.

Diseases of the Eye.—Nitrate of silver is perhaps more extensively used than any other collyrium, and, though in modern practice it is applied less freely and generally than of old, as the indications for its use have been more clearly outlined, it has mainly held its own for many generations. In the treatment of INFLAMMATORY DISEASES OF THE CONJUNCTIVA it would be better to be deprived of any or every other topical application than of this old and well-tried agent, for by judiciously varying the strength of the applications and the manner of making them we can get the effect of an astringent, caustic, stimulant or antiseptic.

Simple ACUTE CONJUNCTIVITIS is better treated with milder applications, such as boric acid, borax, alum and tannin, but in the more chronic form the nitrate is a most useful remedy. It is not well borne by the cornea and, according to some authorities, may cause permanent opacity where there are ulcerations, by its action in coagulating albumen. It should, therefore, not be dropped into the conjunctival sac in stronger solution than one or two grains to the ounce, and as a rule should be applied by the surgeon or under his immediate supervision, as its long continued use will cause an immovable and most unsightly staining of the conjunctiva. Some years ago it was not uncommon to meet with patients disfigured by this local argyria for life, but such an occurrence is now fortunately very rare.

In the CHRONIC FORMS OF SIMPLE CONJUNCTIVITIS the mucous lining of the upper lid is most affected, and the application should be made to it directly, by means of a brush, or, better, of a pledget of absorbent cotton on the end of a fine probe or small stick, as the latter may be thrown away when once used, and all danger of communicating infection to other patients avoided. When the upper lid is everted the lower can be pushed up under the posterior edge of the cartilage and the ocular conjunctiva and the cornea be thus completely protected. From two to four grains, occasionally if a stronger impression is desired ten grains, to the ounce may be applied in that way. The lid should be washed with absorbent cotton and warm water before it is allowed to close, but this should not be done too quickly; an instantaneous removal may almost neutralize the effect of a strong solution, and the impression made by an application may be decidedly varied by the time it is allowed to remain in contact with the conjunctiva. If a strong solution has been used it is well to neutralize it with salt water. In granular ophthalmia nitrate of silver is used more freely, and is the main dependence in its treatment. The late Dr. Littell, for many years surgeon to the Wills Hospital, who paid much attention to that subject, and had an exceptionally long and extensive experience with it, used to say that he had faithfully tried every remedy suggested for a quarter of a century, but always found himself relapsing to the nitrate. Modern ophthalmic surgery has not yet found anything that promises to permanently replace it, though the treatment may be favorably varied by the occasional substitution of other applications, such as bichloride of mercury, alum, copper sulphate, tannin, sulphate of zinc, and boroglyceride. The strength of the solution, as well as the length of time it is allowed to remain in contact with the conjunctiva, must be determined by the condition of the latter, and some experience is required so to regulate as to get the best effect. Five and ten grain solutions are the most generally useful, though ten or twenty may sometimes be used with advantage. The solid "mitigated stick" is more efficient than very strong solutions, and its action is more easily localized. It consists of nitrate of silver and nitrate of potash fused together. The argenti nitras dilut. of the U. S. P., contains fifty per cent. of the silver salt, but the "mitigated caustic" of the B. P. (argenti et potass. nit.) containing thirty-three per cent. is more generally used. This remedy should be used with caution, and it should be remembered that the object is rather to stimulate the granular masses to absorption than to "destroy" them, though the nitrate has also an astringent and mild caustic effect. Its advantage as a caustic is its superficial action, as by its property of coagulating albumen it forms a protecting film, which prevents deeper penetration. It should be neutralized with salt water or oil before the lid is replaced. When the palpebral conjunctiva is much thickened, and the "granulations" are very prominent, careful scarification, now perhaps too much neglected, is often useful, and some surgeons think well of the galvano-cautery. When these surgical means are used, care must be taken not to involve the sub-conjunctival tissue, and thus increase the cicatricial contraction, which is one of the worst results of the disease.

In PURULENT CONJUNCTIVITIS, also, nitrate of silver is generally considered the most efficient application. In the earlier stages, while the discharge continues watery, serous or sanious, and the conjunctiva has a glazed appearance, it should not be used. Iced cloths should be continuously applied, and thorough cleanliness insured by frequent bathing with mild astringents or antiseptics. Some surgeons prefer the continuous or intermittent application of hot water, to the cold. When the discharge becomes distinctly purulent and the conjunctiva is swollen and velvety, the nitrate may be applied to the entire lid, in the manner already described. In the case of adults, a ten-grain solution is most frequently employed. Usually one application in twenty-four hours will be sufficient, but in bad cases it may be well to repeat it twice a day. A one-grain solution is sometimes dropped into the eye every hour or two, in addition.

The same principles apply to the treatment of OPHTHALMIA NEONATORUM. The use of iced clothes is impracticable, but hot stupes (112° F.) applied for ten or fifteen minutes at a time, three or four times a day, are useful. In many cases a two- or four-grain solution will be strong enough, particularly if it is used more than once a day; but if the discharge is very abundant and the source of contagion is gonorrhœal, ten grains may be needed. Great attention has recently been given to the prevention of this disease, which has been the most fruitful of all the causes of blindness. The method of Crède, of Leipsic, which has attracted much notice, is founded on the powerful antiseptic properties of nitrate of silver, which is said to destroy the gonococcus and prevent contagion. He applies one drop of a two per cent. solution between the lids of the child immediately after birth. As a result of this treatment, the percentage of cases of ophthalmia in the Lying-in Hospital of Leipsic was reduced from 7½ to 0.½. The question has arisen in several European States, whether this practice should not be made obligatory by legal enactment; but this somewhat heroic prophylaxis is scarcely necessary in the better class of patients, and it may well be left to the judgment of the attending physician to employ it only when the mother is known to be suffering with a blennorrhœal discharge, and to content himself in other cases with perfect cleanliness insured by washing the eyes with a solution of bichloride, boric acid or borax, or with simple warm water.

ARGENTI IODIDUM. Iodide of Silver.

"This is a new officinal salt, which may be readily prepared by adding a solution of iodide of potassium to one of nitrate of silver, and washing and drying the precipitate, which should be kept in dark amber-colored vials, protected from light." (U. S. D.)

Diseases of the Eye.—Iodide of silver has usually been added to the list of applications in the treatment of TRACHOMA. (*Ophthalmic Record*, No. 3.)

ARISTOL. Di-iodo-di-tymol. Annidalin.

"Aristol is a light brown, fine, adhesive, inodorous powder, containing 45.8 per cent. of iodine. It is readily soluble in ether and in fatty oils, slightly soluble in alcohol; it is insoluble in water or in glycerin. It is readily decomposed by heat and exposure to light. It is soluble in collodion." As the iodine is held very loosely in combination, almost any other substance for which iodine has affinity liberates it, so that as a dressing for wounds its use is confined for the most part to the commercial powder, to the form of the soluble collodion, or to mixture with fats.

Aristol should never be prescribed in conjunction with starch, caustic alkalies, carbonates, or with substances which possess affinity with iodine, such as ammonia, the metallic oxides, corrosive sublimate, etc.

Aristol is antiseptic and protectant.

General Surgery.—Aristol has been introduced in general surgery as a substitute for iodoform. It is odorless. and in all cases harmless in action. While it may be pleasanter for the patient, it is not nearly so active a remedy in the treatment of VENEREAL SORES as is iodoform. In the treatment of WOUNDS (by dusting over the part, or used in prepared gauze) it serves as a protectant.

Diseases of the Skin.—In Eichoff's opinion (*Monatsch. f. Pr. Dermatol.*, No. 2, January 1890) aristol possesses the valuable properties of both iodoform and thymol to a higher degree than either of its component parts. This appears to give it the advantage over chrysarobin and pyrogallic acid in the treatment of diseases like psoriasis, when an extensive area is to be acted on and absorption may take place.

Aristol has been employed with success by some German physicians in PSORIASIS, the vegetable parasites of the skin, and in ULCERS, whether simple or syphilitic, also in LUPUS and EPITHELIOMA.

While generally conceded to be valuable in syphilitic and other ULCERS, the virtues of aristol have been disputed by many observers. Its effect appears to be cornifying only, and it does not seem to act upon the deeper layers of the skin nor to destroy new growths.

J. J. Levick (*Medical News*, July 25, 1891) found good results from powdering the hands in DERMATITIS VENENATA (rhus poisoning) with aristol. He suggests that it may prove useful in the treatment of VARIOLOUS ERUPTION.

Diseases of the Ear, Throat and Nose.—Insufflations of the powder of aristol have been employed by Rorer (*Archives Internacionales de Laryngologia*, 1890, No. 2) for ACUTE CATARRHAL OTITIS. Lowenstein (*Int. klin. Rundschau*, May, 1890) has used aristol in the treatment of OZÆNA, in a ten per cent. ethereal solution (in the proportion of a drachm to the ounce) with good results. It also proves available for CHRONIC NASAL CATARRH, by being dissolved in one of the forms of petrolatum. Exhibited as a flexible collodion, one drachm to the ounce, W. C. Phillips (*N. Y. Med. Jour.*, May 23, 1891) applies aristol in CHRONIC ATROPHIC RHINITIS in OZÆNA and in ULCERS OF THE SEPTUM, both specific and non-specific. The agent is highly extolled by some practitioners in the treatment of SYPHILIS OF THE NOSE, accompanied with ulceration, when used in the form of a powder and blown on the parts. The objections to iodoform are obviated and the powder does not as a rule irritate. A small proportion of morphine may be added to the mass or it can be combined with borax and tannic acid.

Aristol has come largely into use as an adjuvant in the after-treatment of intra-nasal operations. Cotton plugs, if covered with cosmoline and thoroughly dusted with aristol, remain free from odor a longer time and with less irritation than if prepared in any other way. A. B. Kirkpatrick, of Philadelphia, claims that aristol prevents the formation of exuberant granulations, after operations on the nasal septum. In LARYNGORRHŒA, aristol may be blown into the larynx.

Diseases of the Eye.—Aristol has been recommended as an antiseptic dressing in operations upon the eyelids and ENUCLEATION OF THE BALL, as a substitute for iodoform; experience has still to prove if it is equally effective. It is unirritating, even to the conjunctiva, and may be dusted freely on the parts involved in the operation.

It has also been recommended in the treatment of PHLYCTENULAR CONJUNCTIVITIS, dusted upon the ulcer in the same manner as calomel has long been used. An ointment containing five grains of aristol to one drachm of cosmoline is said to be of value in BLEPHARITIS MARGINALIS and in ECZEMA OF THE EYELIDS.

ARNICA. Arnica.

Both arnica flowers (*Arnica Flores*), and the root (*Arnica Radix*), respectively the "flower heads" and "the rhizome and the rootlets" of *Arnica montana*, are official in the U. S. P. "*Tincture of Arnica*" is a tincture of arnica flowers, containing the activity of twenty parts of the flowers in one hundred of alcohol. There is also official in the U. S. P. and Ph. Br. a *Tincture of Arnica Root*, that of the U. S. P. containing the activity of twenty parts of the root in one hundred of tincture. When "tincture of "arnica is spoken of in America, the tincture of the flowers is always intended; in Great Britain, the tincture of the root is meant. An *Extract of Arnica Root* (of uncertain strength) and a *Fluid Extract of Arnica Root* (of which one cubic cm. represents one gram of arnica root) are also official. (U. S. P.)

General Surgery.—The tincture of arnica is a popular application for relief of SPRAINS, BRUISES AND EXTERNAL INFLAMMATIONS; yet violent erysipelatous inflammation has been known to follow its use. This is likely to occur if the application is covered with an impermeable dressing, which prevents evaporation. It is said that the infusion or decoction of arnica is not so liable to produce local irritation as is the tincture. Notwithstanding its popular reputation, there is nothing to show that arnica is superior, as a local application, to laudanum and water, lead water, and other sedative lotions.

Diseases of the Mouth.—Arnica is described by Leffmann ("American System of Dentistry," III, 695) as a stimulant in inflammation of the mucous lining of the mouth. Equal parts of tincture of arnica and glycerin diluted with water is employed by dentists.

AURI ET SODII CHLORIDUM. Chloride of Gold and Sodium.

"A mixture composed of equal parts of dry chloride of gold and chloride of sodium." (U. S P.) It is "of a golden yellow color, and, when crystallized, is in long prismatic crystals, unalterable by exposure in the air." (U. S. D.) It is soluble in water. It should be protected from light. The chloride of gold can be dissolved out of the double salt by alcohol.

Chloride of gold is antiseptic and escharotic. It bears a resemblance in therapy to the bichloride of mercury.

Diseases of the Throat, etc.—J. Solis Cohen ("Diseases of the Throat") refers to this agent as a substitute for the nitrate of silver in the treatment of inflammation of the pharynx. It can be used in strengths varying from fifty to sixty grains to the ounce of water. A solution of the chloride of gold is employed in dentistry to overcome the sensitiveness of dentine.

Diseases of the Eye.—Chloride of gold was some years ago strongly recommended as an application in GRANULAR LIDS, substituting nitrate of silver, but did not survive the test of clinical trial and soon went out of use.

BALSAMUM PERUVIANUM. Balsam of Peru.

"A balsam obtained from *Myroxylon Pereiræ*. A thick liquid, brownish-black in bulk, reddish-brown and transparent in thin layers, having a syrupy consistence, a somewhat smoky, but agreeable and balsamic odor, and a warm, bitter, afterward acrid taste. It is entirely soluble in five parts of alcohol." (U. S. P.) It is insoluble in benzin; readily miscible with chloroform or glacial acetic acid. Balsam of Peru is adulterated with various substances, such as Canada turpentine, castor oil, copaiba, and alcohol. A solution of balsam of Peru in alcohol is sometimes sold for it.

Balsam of Peru is protectant, sedative, and parasiticide.

Diseases of the Skin.—Balsam of Peru is employed as a mild antipruritic and parasiticide, usually in combination with other applications.

In PRURITUS VULVÆ Tausky recommends: ℞. Bals. Peru., ʒj; pulv. acaciæ, ʒij; ol. amygdalæ, ʒiss; aqua rosarum, ℥j. M. Sig. Apply freely with a brush, eight or ten times a day, to the itching parts.

In SCABIES Balsam of Peru may be used alone, or in combination with other remedies, as in the following formula recommended by J. C. White, of Boston: ℞. Bals. Peru, ℥j; flor. sulphuris, ʒij; naphtollis, ʒj; vaselin, ℥j. M.

In the form of one-half drachm to an ounce of cosmoline, balsam of Peru forms an admirable base when it is desired to use iodoform in the shape of an ointment.

Diseases of the Nose and Throat.—Balsam of Peru is used by Ebstein as a local application in ATROPHIC RHINITIS. Cotton tampons are soaked with it and carried in the nasal chambers. A pigment of eighty grains of the balsam to an ounce of ether is used by M. Mackenzie in TONSILLAR DIPHTHERIA. It has a remarkably efficacious effect when used as an inhalation in laryngeal phthisis (*Journal of Laryngology and Rhinology*, 1887.) Schmidt (*Ibid.*, p. 162) recommends steam inhalations containing 20–30 drops of the following mixture to a pint of hot water:—Balsam of Peru, 10 grms; alcohol, 5 grms. It may be applied locally to the ulcerative stage of the disease just named. Mixed with elastic collodion, it may protect tubercular ulceration of all parts of the tongue and adjacent parts. (Schnitzler, *Congrès de Laryngologie*, Paris, Sept., 1889.) It may be variously combined with astringents.

Rosenberger (*Therap. Monatschrift*, p. 10, 1888), recommends it in white patches (IDIOPATHIC LEUCOPLASIA) of the oral cavity. He finds it anesthetic, and calculated to restore the diseased tissues to their normal condition. The balsam, which must be pure, is laid thickly on the affected parts with a camel's hair brush. It sometimes gives rise to slight burning with increased salivation, but must be retained in the mouth three to five minutes, and should be repeated several times daily. Thirteen cases treated thus resulted favorably, or at least improved greatly.

Balsam of Peru forms the main ingredient of the so-called *Mistura Oleo-Balsamica*, as per ensuing formula: ℞. Oil of lavender, oil of cloves, oil of cinnamon or cassia, oil of thyme, oil of lemon, oil of mace, oil of orange flowers, each 1 part; balsam of Peru, 3 parts; alcohol, 240 parts. Mix, and macerate for several days, shaking often, then filter.

Other preparations are known under the same name as above. Two formulæ are herewith presented :—

℞. Oil rue, ♏x ; oil cedrat, cinnamon, cloves, lavender, mace, marjoram, of each ♏xx ; balsam Peru, ʒss ; alcohol, Oss.

℞. Oil cinn., cloves, lavender, lemon, neroli, nutmeg, thyme, each ♏xx ; bals. Peru, ʒj ; alcohol, Oss.

BALSAMUM TOLUTANUM. Balsam of Tolu.

" A balsam obtained from *Myroxylon toluifera*. A yellowish or brownish-yellow, semi-fluid or nearly solid mass, transparent in thin layers, brittle when cold, having an agreeable, balsamic odor, and a mild, aromatic taste. It is entirely soluble in alcohol; almost insoluble in water and in benzin." (U. S. P.) It is one of the constituents of the Compound Tincture of Benzoin. (Turlington's Balsam, Friar's Balsam, Wade's Balsam.) A Tincture of Tolu is official; it contains ten per cent. of the balsam.

The balsam of tolu is a protectant antiseptic and alleviates cough.

Diseases of the Throat.—M. Mackenzie uses a solution of one to five as a varnish on DIPHTHERITIC DEPOSITS ; the membrane should be first dried with blotting paper before the application is made; of the balsam eighty grains, ether one ounce, as a pigment, to be applied with a brush to the diphtheritic deposits on the tonsils and pharynx. Vapor inhalations of tolu are recommended for the treatment of CHRONIC PHARYNGITIS. A lozenge of the balsam is prepared in the proportion of one-fifth of a grain. In the form of a tincture tolu is sometimes added to sprays. Owing to its tenacious character a small proportion suffices.

BELLADONNA. Belladonna.

In both the U. S. P. and Br. P. the leaves as well as the root of *Atropa belladonna* are official. In the U. S. P. the alcoholic extract and the tincture are made from the leaves the plaster and the fluid extract from the root. In the Br. P. the extract, the succus, and the tincture are made from the leaves, and the alcoholic fluid extract, the liniment, and atropine are made from the root. The preparations of belladonna used externally in this country are the *Alcoholic Extract* (of uncertain strength), *Tincture of Belladonna* (fifteen parts of belladonna leaf in one hundred parts of tincture), *Atropine*, the *Plaster* (one hundred parts of belladonna in one hundred parts of the plaster); the *Ointment*, made by incorporating ten parts of the alcoholic extract of belladonna, softened with six parts of diluted alcohol in eighty-four parts of benzoinated lard; and, rarely, the *Fluid Extract* (one gramme of belladonna root in one cubic centimetre of fluid extract), and the *Liq. Atropinæ Sulphatis*.

Atropine is characterized by "colorless or white, acicular crystals, permanent in the air, odorless, having a bitter, acrid taste, and an alkaline reaction." (U. S. P.) It forms salts with acids, in which form it is medicinally used, the salt in general use being the sulphate. The sulphate of atropine is soluble in 0.4 part of water and 6.5 parts of alcohol.

The decomposition products of atropine are tropine and tropic acid. Derived from tropic acid is the substance known as homatropine; the hydrobromate of homatropine is much used as a mydriatic. This salt is soluble in ten parts of water.

An Oleate of Atropine is in the trade.

"Ladenburg has exhaustively studied the several sources of atropine, and the allied alkaloids that exert a mydriatic action, and found that there are three alkaloids, *atropine*, *hyoscyamine*, and *hyoscine*, which possess the common formula: $C_{17}H_{23}NO_3$, and in belladonna root, *belladonnine*, $C_{17}H_{23}NO_4$. Of these, *atropine* occurs in *Atropa belladonna* and in *Datura stramonium*; *hyoscyamine* in these plants, and also in *Hyoscyamus niger* and *Duboisia myoporoides*. Hyoscine is found in *Hyoscyamus niger* alone, and *belladonnine* in belladonna root alone." (U. S. D.)

The popular preparation known as *Baume Tranquille*, and recommended for OTALGIA when instilled into the outer ear, is an infusion in olive oil of narcotic and aromatic plants. The narcotics are belladonna, conium, hyoscyamus, and stramonium, with some opium added. The aromatics are sage, wormwood, lavender, and thyme.

Belladonna is sedative, antispasmodic, mydriatic, resolvent, and antisecretory.

General Surgery.—Belladonna is known to possess the power of ARRESTING THE SECRETION OF MILK. It is employed with advantage when, the mother being unable to suckle her child, the breasts become swollen and painful, and threaten to suppurate unless the tension of the ducts be relieved. If the milk cannot be drawn off artificially, the secretion must be suppressed. The drug should be applied before inflammation has set in, in which case the swelling and pain in the breast generally subside in a few hours, and the gland becomes soft and painless. Even if inflammation has already begun and the breasts have become tense, shining, hard, knotty, red, and acutely painful, an ointment of belladonna should be applied, and over it a warm flaxseed poultice, the entire breast being thoroughly supported. This treatment, continued for forty-eight hours, will often arrest the formation of pus. The method should be employed in all cases, no matter how far the mastitis has advanced. Even when the agent fails to prevent suppuration, it reduces the inflammatory process and lessens pain. Where belladonna ointment is objectionable on account of its peculiar odor and its liability to soil the clothing, similar results can be obtained by hot fomentations of rose water with atropine in solution of four grains to the ounce, care being taken to watch the systemic effect as shown by dilatation of the pupil and dryness of the mouth.

The addition of belladonna to iodine ointment increases its efficiency in the treatment of ADENITIS. A useful prescription in this condition is the following: ℞. Ung. plumbi iodidi, and ung. belladonnæ, equal parts. This may be rubbed thoroughly into the inflamed part twice a day. An ointment composed of equal parts of ung. belladonnæ and ung. hydrargyri, is almost universally used in the hospitals of Philadelphia in the treatment of Chronic Inflammatory Conditions about the Articulations. It is of great service in conjunction with blisters, and rest in the treatment of Chronic Synovitis of the Knee Joint. After counter-irritation, the part is to be enveloped in lint, on which is spread a thick coating of the ointment covered with waxed paper and firmly bandaged. John Ashhurst often uses this treatment with great success in the local treatment of Peritonitis, the abdomen being covered with lint on which has been spread the ointment, and the whole enveloped with a large hot poultice. The application should be continued until slight ptyalism is induced.

In the treatment of Boils, Carbuncles, and Abscesses, it is an excellent plan to smear the inflamed tissues with an ointment composed of equal parts of extract or ointment of belladonna and glycerin, and on this dressing to superimpose a hot poultice. Belladonna plaster is largely used for the relief of Plurodynia, Intercostal Neuralgia, Pleurisy, and muscle pains of Rheumatism. It is also applied over the region of the heart in functional and organic diseases of that organ. The skin must be thoroughly cleansed with soap and water, and afterward washed with alcohol or vinegar. This will insure the plaster adhering, and at the same time promote absorption of the drug. The same effect may be obtained from the use of either the liniment or the ointment of belladonna. Care must be exercised in the application of belladonna to large surfaces that have been denuded of epithelium. Belladonna used for its constitutional or its local effect, is much more active and prompt when in contact with the mucous membranes than when applied to the cutaneous surfaces. The extract of belladonna in conjunction with tannic acid, in the proportion of one or two grains of the extract to eight or ten of the acid, is recommended by Trousseau in Leucorrhœa with accompanying ulceration of the os uteri, the agent appearing to arrest the abundant secretion from the mucous glands. The mixture may be wrapped in cotton, or made into a suppository with cocoa butter, and placed in contact with the os. When the condition is associated with much pain, the following injection yields good results: ℞. Sodii bicarb., ʒj; tinct. belladonnæ, ℥ij; Aquæ, Oj. M. The syringe should be introduced as far as possible, while the patient lies on the back with the buttocks elevated on a pillow.

In the genito-urinary tract of the male belladonna is of great service, especially for the relief of Spasmodic Stricture of the Urethra, or Spasm of the Neck of the Bladder, following over distention, a condition often met with after a debauch. It is also of value in the preparatory treatment of strictures of small calibre, especially those of an irritable nature. In all classes of conditions it is imperative that the patient should be brought under the influence of the drug, preferably by means of a suppository of half a grain of the extract of belladonna inserted into the rectum about half an hour before the proposed introduction of the instrument. In many cases what would otherwise be an impermeable stricture, can readily be passed. In some cases of tight stricture it is advisable to smear the instruments with the ointment of belladonna instead of sweet oil. By this means the local effect of the drug is supposed to be made more prompt and active. Care, however, ought to be exercised that too much of the drug does not find its way into the system from the mucous membrane of the urethra. It must be remembered that belladonna is of little service when the retention of urine is due to an enlarged prostate, as it has a tendency to paralyze the vesical expulsive muscles; and where the desire to pass water arises from the presence of urine which the bladder fails to expel, the difficulty is only aggravated by belladonna. In STRANGURY following the absorption of cantharides from large blisters, and also from the use of turpentine, belladonna combined with opium will prove a satisfactory remedy. In irritable spasms and neuralgic conditions belladonna may be combined with advantage with opium and camphor.

In ORCHITIS immediate relief may be obtained by enveloping the testicle in lint on which has been spread a thick coating of belladonna ointment, and applying over this fomentations of hot water. In CHORDEE Mr. Hill recommends a suppository of extract of belladonna and morphine.

In FISSURE OF THE ANUS Dupuytren states that belladonna is of service in inducing relaxation of the sphincter. It may be applied in a suppository, or the following: ℞. Ext. belladonnæ, plumbi acetatis, āā ʒj; adipis, ʒvj. M. Sig. Applied three or four times daily. In the treatment of HEMORRHOIDS belladonna is incorporated with many ointment bases. The following prescription is used at the University of Pennsylvania Hospital: ℞. Ext. belladonnæ, gr. x; ext. stramonii, ʒss; acid. tannici, gr. viij; adipis, ℥j. M. Ung. The selected part should be washed before the application of the ointment. When the hemorrhoids are accompanied with much itching, the following ointment may be found of service: ℞. Ung. hydrarg. nitratis, ʒj; ung. belladonnæ, ʒvij. Allingham recommends that when the masses are inflamed they be anointed with equal parts of extract of opium and of belladonna, and then be covered with a hot poultice, though in some cases a cold application may be found to be more grateful.

Diseases of the Skin.—Belladonna is employed in the treatment of HYPERIDROSIS, and in affections of the skin where excessive sweating interferes with the action of other remedies. In excessive sweating of the palms and soles, or of the axilla, groins, etc., the tincture may be painted on the previously dried surface once a day, and followed by the use of an astringent powder.

The dried and powdered extract of belladonna may be employed as a dusting powder, and is particularly useful in ECZEMA of the groins, thighs, scrotum, anus, and neighboring parts, especially when occurring in the summer season and accompanied by excessive sweating. It should be carefully mixed with a dessicant powder, as oxide of zinc, subnitrate of bismuth, starch, or fuller's earth. The proportion should be one to two drachms to the ounce of the excipient.

The extract of belladonna may be employed alone. (The official ointment is 48 grains to the ounce, but in referring to English works it is well to remember that the British preparation is nearly twice as strong.) It is found useful as a dressing in painful ulcers, and also in other painful conditions of the skin, as in ECZEMA OF THE ANUS. It has a certain value also in PRURITUS ANI. The constitutional effects should be guarded against.

Atropine is employed for the same purposes as belladonna. Its external employment is rare; usually it may be substituted by belladonna.

Diseases of the Ear, Nose, and Throat.—Solutions of atropine, in three to five grains to the ounce, are of value in RHEUMATIC OTALGIA. One or two drops may be instilled at a time. Although its use is not contra-indicated by an opening in the tympanic membrane, it is necessary to bear in mind the ease by which the medicine may pass down the Eustachian tube to the pharynx. E. D. Williams recommended the atropine treatment as one of the best at our command. Keene recommends atropine as a remedy for TINNITUS. The liquor atropii diluted with an equal quantity of water may be injected by the Eustachian catheter. T. F. Rumbold (*Trans. Amer. Rhinol. Ass'n*, 1886) uses a strength of five grains to the ounce in the local treatment of HAY FEVER. A few drops are directed to be placed on a pledget of cotton and inserted in the nostril. Mixed with cocoa butter, atropine, one-twentieth of a grain, or one-quarter of a grain of the alcoholic extract of belladonna, may be exhibited in the form of a NASAL BOUGIE. For the treatment of ACUTE RHINITIS the powdered leaves enter into the composition of a snuff, as follows: pulverized leaves one scruple, morphine sulphate two grains, pulverized acacia a half ounce. Atropine is occasionally employed in the local treatment of LARYNGEAL PHTHISIS. Inhalations of water, in which a small proportion of tincture of belladonna has been added, relieves the pain of CHRONIC LARYNGITIS.

Diseases of the Eye.—Atropine is always used in the form of the soluble sulphate or salicylate, the alkaloid itself being very sparingly soluble in water. It is useful as a powerful local anodyne, but chiefly by its action in dilating the pupil and paralyzing the muscle of accommodation. Its exact mode of action is not yet definitely determined. It is known to be local. It must be absorbed and reach the iris directly before it can act. The aqueous humor of an atropinized eye contains sufficient atropine to dilate the pupil of another eye. It causes mydriasis when applied to the eye immediately after death, or, in experiments upon animals, after removal of the brain and spinal cord. Its action is upon unstriated muscle, and it does not affect the pupil of birds whose iris muscular fibres are of the striated kind.

It is erroneously stated that atropine dilates the pupil by paralyzing the sphincter fibres and stimulating the radial; the former being under the control of the oculo-motor nerve, and the latter of the sympathetic. The existence of dilator muscular fibres in the iris, however, may now be considered extremely doubtful, and is positively denied by some of the best authorities. According to these authorities the dilatation of the pupil is the result of elastic contraction, and the only structure of the iris that takes an active part in it is the posterior limiting membrane, which is the only one not thrown into folds when the pupil dilates. (Fuchs, *v. Graefe Arch.*, XXXI, p. 89, and *Oph. Rev.*, Jan., 1886.) It is not easy, however, on this view to account for the following facts, viz.; that mydriasis from pathological or experimental paralysis of the third nerve is increased by the application of atropine; that the pupil dilated by atropine immediately contracts when the sympathetic nerve is severed and dilates again when the nerve is excited by faradization; or that cocaine, which is supposed to produce mydriasis by its excitant effect on the sympathetic, increases the dilatation of an atropinized eye. Gaskell (*Journal of Physiol.*, Jan., 1886) thinks that in the sphincter muscle of the iris we have an example of a muscular structure supplied by two nerves of opposite character, the one motor and the other inhibitory, and that dilators of the pupil act upon the latter. According to this view atropine increases paralytic mydriasis by inhibition of the tonic contraction of the sphincter muscle.

Some observers have thought that the vaso-motor action of atropine, in contracting the iris blood-vessels, is an important factor in producing mydriasis.

Belladonna is extensively used in ophthalmic surgery. As a mydriatic the full effect of atropine may be rapidly obtained by a solution of four grains to the ounce. When one drop of this is instilled in the conjunctival sac of a healthy eye, the dilatation of the pupil commences in less than fifteen minutes, and attains its maximum, with complete immobility, in twenty or twenty-five. When it is desired to dilate the pupil merely to facilitate ophthalmoscopic examination, a much weaker solution should be used, as mydriasis produced by the strong application does not completely disappear for nearly, or quite, two weeks. A solution of a quarter of a grain to the ounce produces dilatation in half an hour, and the effect passes off in three or four days. Atropine is now, however, not so much used as formerly, for this purpose, as homatropine or cocaine involves much less inconvenience to the patient. Its most important therapeutic application is in the treatment of IRITIS, in which it is the remedy above all others. The great danger in this disease is adhesion of the iris to the lens capsule, and, in a large proportion of cases, is practically over when the pupil is once well dilated and its margin is thus withdrawn from contact with the lens. Unfortunately the action of the drug is resisted and too often cannot be induced unless the application is used at the commencement of the affection. The absorption of atropine by the cornea is diminished by the increased intraocular tension, and even before adhesions have occurred the hyperæmic and œdematous iris responds slowly and imperfectly to the action of the mydriatic. This action is materially promoted by the local abstraction of blood by means of leeching or cupping at the temple. When there is great increase of tension, paracentesis of the cornea is useful. Freshly formed adhesions may often be broken up, and even when the adhesions are firmer, partial and irregular dilatation can usually be obtained. In specific iritis, obstinate synechiæ sometimes yield after the administration of mercury. A solution of four grains to the ounce is generally used, and in most cases three or four applications a day are sufficient. In some cases it is necessary to repeat them more frequently, even every two or three hours, or a more decided effect may be obtained by making the application every fifteen minutes for an hour three times a day. A solution of eight grains to the ounce is sometimes used by the surgeon, but is not often entrusted to the patient. Even the weaker solutions must be used with care, as in specially sensitive subjects constitutional poisoning may result. The danger of this is diminished by pressure on the puncta with the end of the finger during the application.

In cases of NUCLEAR CATARACT, with the periphery of the lens comparatively clear, great improvement of vision is often secured by keeping the pupil continuously dilated with atropine instilled two or three times a week. By this proceeding and the careful correction of any existing defect of refraction, patients are often enabled to enjoy useful sight for months, or even years, before the whole lens becomes involved in the opacity.

In the treatment of PHLYCTENULAR KERATITIS, which is usually accompanied by considerable ciliary irritation with contraction of the pupil, atropine is valuable as a powerful sedative, and by putting the pupillary and accommodative actions of the eye at rest. A one- or two-grain solution may be combined with ten grains of boric acid, or, if there is much conjunctival discharge, with half a grain of alum. In wounds involving the cornea and iris, a four-grain solution is commonly used. Atropine is useful in most cases of KERATITIS, particularly in the acute form, with a painful and irritable condition of the eye. In cases of INDOLENT CORNEAL ULCER, or SLOUGHING OF KERATITIS, or when the intraocular tension is much increased, eserine sometimes acts better. This subject has been much discussed, but the indications for the use, in corneal affections, of these two drugs, so opposite in their action, are not yet definitely formulated. The surgeon will, in many cases, have to be guided by the teachings of his own experience, or by trial. Superficial ulcerations are best checked by the actual cautery, while in extensive sloughing involving the deeper layers of the cornea, a free "Sæmisch incision" often offers the only hope of success. Compresses and hot stupes are important aids in the treatment. In the case of a penetrating ulcer or wound near the centre of the cornea, dilatation of the pupil is indicated to prevent prolapse of the iris.

Atropine is not now nearly so generally used as formerly after CATARACT EXTRACTION, and is thought to increase the tendency to prolapse of the iris, particularly in the case of operation without iridectomy. Many surgeons use eserine to draw the iris away from the corneal wound. After the incision is healed, however, atropine is useful by dilating the pupil and contracting the blood-vessels of the iris. If iritis sets in its use is imperative. Dilatation of the pupil before the operation is secured by the application of cocaine, which is now almost universally used for its anæsthetic effect. It is customary to apply atropine both before and after the operation for solution.

Atropine acts more slowly on the accommodation than on the pupil. According to Donders a four-grain solution commences to act in about fifteen minutes, but complete paralysis is not attained until more than an hour and a half. There is a full return of accommodation in eleven days, rather earlier than the restoration of the pupil's action. As, however, there is a decided variation in the susceptibility of different individuals, and a ciliary muscle irritated by excessive strain resists the action of the drug, to be sure of the full effect it is customary to make the application three times a day for a day or two. Attained in this way the effect does not usually disappear entirely in much less than two weeks. This property of atropine has occasionally a therapeutic value in cases of spasm of the accommodation, or when it is desired to relieve the EFFECTS OF EXCESSIVE ACCOMMODATIVE STRAIN by a period of complete rest, but its most important use is in the determination of the refraction. The action of mydriatics in suspending the accommodation is invaluable to ophthalmic surgeons in their optical work, as the contraction of the ciliary muscles introduces an unknown and varying factor, which is liable to vitiate the most careful calculations, and in young subjects no certainty can be reached while this muscle is allowed full play.

Patients are occasionally met with in whom the application of atropine produces a peculiar form of conjunctivitis. The conjunctiva is congested and the eye is irritable and watery, and the follicles in the conjunctival folds are sometimes enlarged. There is usually, also, erythematous inflammation of the skin of the lids and cheek. This form of conjunctivitis is, in very rare cases, produced by a single instillation, and results from a too prolonged use of the drug, perhaps more frequently than is generally supposed. Kroener (*Oph. Rev.*, Jan., 1882) thinks that atropine conjunctivitis is of septic origin, and is due to the FUNGOID GROWTHS found in solutions that have stood for some time, and recommends the addition of carbolic acid (1 to 1000) to keep the solution clear. This view is not generally adopted.

A more serious danger is the tendency of atropine to induce GLAUCOMA. This it is thought to do by increasing the thickness of the iris and crowding its periphery into the angle of the anterior chamber, thus impeding the escape of fluids by way of the space of Fontana. The irritation of excessive light through the dilated pupil, when the eye is not protected, may be another cause. Atropine should never be applied when there is suspicion of glaucoma, and its use in the case of old people should be cautious, and at first tentative, in weak solutions, except when iritis makes an immediate and decided effect imperative. The now universally admitted fact that atropine may increase intraocular tension is in apparent contradiction to the opinion of the earlier observers that it reduces it by contracting the blood-vessels and diminishing secretion. It seems probable, however, that it diminishes pressure in the healthy eye, but, by the mechanical effect of the dilated pupil, increases it "in the eye predisposed to glaucoma, because the angle of the anterior chamber is already dangerously narrow" (Priestly Smith). Stocker, of Lucerne (*Oph. Rev.*, vol. VI, p. 359) states positively, as the result of numerous experiments with the manometer on curarized cats, that under physiological conditions atropine always produces a decided fall in the intraocular pressure, thus confirming the view of Graefe, Wegner, Adamück, Grünhagen, and Pflüger.

HOMATROPINE.

Hydrobromate of homatropine, a derivative of atropine, has of late years been extensively used as a means of suspending the accommodation. It is likely, to a great extent, to supplant all other mydriatics in ordinary refraction work; as while equally efficient its effects last less than one-fourth as long as those of atropine, and about half as long as those of duboisine, and the danger of inconvenience from constitutional poisoning is practically nil. Conjunctival hyperæmia and a slight burning sensation usually follow its use, but are much less marked now than at the time of its first introduction, probably on account of improvement in the process of manufacture. There has been much difference of opinion among ophthalmic surgeons as to its reliability, and the subject has been a good deal discussed, but numerous and careful observations have shown that those who find it inefficient do not use it in a way to secure its full effect. Used as it is customary to use atropine, duboisine, or hyoscyamine, it is certainly much less reliable than those mydriatics. The most practical and convincing test of the comparative value of homatropine is that made by E. Jackson (*Phila. Med. News*, July 24, 1886), who first corrected the refraction of fifty-two eyes under homatropine and afterward subjected the same eyes to careful testing with other mydriatics. He claims that a 2 per cent. or 2½ per cent. solution used in the proper way paralyzes the accommodation just as certainly and thoroughly as a 1 per cent. solution of atropine or a ½ per cent. solution of duboisine.

A solution of from ten to sixteen grains to the ounce should be employed. The former is probably sufficient, but some surgeons think that the latter gives greater security of prompt action; the only objection to it is the expense. From three to five applications should be made at intervals of ten or fifteen minutes. The effect commences in from ten to twenty minutes, is usually complete in less than an hour, and lasts from one and a half to four days. In exceptional cases, which are perhaps not very infrequent, it may last longer than the latter period. At the present writing a young man presents himself, in whom the action of the iris and ciliary muscle is still decidedly impaired at the end of four and a half days, and de Schweinitz (*Oph. Rev.*, Dec., 1890) reports a case in which recovery was not complete for nearly six days. There is, however, very rarely any serious inconvenience after the second day. For therapeutic purposes homatropine is inferior to the other mydriatics, and when choroidal and retinal congestion resulting from accommodative strain renders prolonged rest necessary, there is nothing so satisfactory as atropine. To dilate the pupil for ophthalmoscopic purposes, a solution of one grain to the ounce is sufficient and causes little inconvenience.

As to the danger of exciting glaucoma, homatropine has probably no advantage over the other mydriatics but the shorter duration of its effects. A case of glaucoma following its use is recorded by Hodges (*Arch. of Ophthal.*, vol. XIV, p. 42), and in the *Trans. of the Am. Ophthal. Soc'y* for 1890 (Harlan) is reported a case in which transient pulsation of the retinal arteries was repeatedly produced by it.

Several cases have been reported in which the effect of homatropine and of atropine was unusually prolonged. (*Trans. Am. Ophthal. Soc'y*, 1889.)

The supraorbital pain of IRITIS and CYCLITIS is relieved by the application of belladonna ointment to the brow, and this may be particularly useful in cases in which the alkaloids are not well borne by the conjunctiva. A convenient mode of applying belladonna externally is to give the extract the proper consistency by means of water or glycerin, spread it on the skin and cover it with tissue paper.

BENZINUM. Benzin. Benzine. Petroleum Ether.

"A purified distillate from American petroleum, consisting of hydrocarbons, chiefly of the marsh-gas series, having a specific gravity of from 0.670 to 0.675, and boiling at 50° to 60° C. It is a transparent, colorless, diffusive liquid, of strong characteristic odor, slightly resembling that of petroleum, but much less disagreeable. It is insoluble in water, soluble in about six parts of alcohol, and readily so in ether, chloroform, benzol and fixed and volatile oils. It is highly inflammable, and its vapor, when mixed with air and ignited, explodes violently. Benzin, when evaporated on the hands, should leave no odor." (U. S. P.) The odor of benzin is penetrating and unpleasant.

This substance should not be confounded with the article known as benzol or benzene, which is a derivative of coal-tar..

Benzin is refrigerant and rubefacient.

General Surgery.—Benzin evaporates so rapidly that local temperature can easily be reduced, by a spray, to below the freezing point. The spray produced by a hand atomizer will diminish sensibility and secure local anæsthesia so well that this method may be used as a substitute for etherization in small surgical operations. In doing this care must be exercised, as the freezing process may be carried too far and produce frostbite, or even sloughing. The action of benzin, applied with friction, resembles that of turpentine. Benzin is sometimes applied on flannel, or with friction, for the relief of RHEUMATIC and NEURALGIC PAINS.

On account of its low cost benzin is commonly used in the Paquélin thermo-cautery, although the lighter hydrocarbons, as gasolin and rhigolin, will answer a similar purpose.

BENZOIN.

"A balsamic resin obtained from *Styrax Benzoin*." (U. S. P.)

Benzoin is soluble in "five parts of moderately warm alcohol, and also in solution of potassa." (U. S. P.) "It is precipitated from its solution in alcohol by water. It imparts to boiling water a notable proportion of benzoic acid." (U. S. D.) Benzoin preserves fats from oxidation, and is for this purpose a constituent of many ointments. It is employed in pharmacy in preparing *Benzoinated Lard* (two parts of benzoin digested in one hundred parts of hot lard): *Tincture of Benzoin* (one part of benzoin to five parts of alcohol); and *Compound Tincture of Benzoin* (containing benzoin, aloes, storax, and balsam of tolu). In evidence of the popularity of benzoin, it may be mentioned at this place that the compound *Tincture of Benzoin* is known also as *Wade's Balsam*, *Friar's Balsam*, *Jesuit's Drops*, *Turlington's Balsam*, *Elixir traumaticum of Baume de Commandeur de Permes*, etc.

The composition of the compound tincture of benzoin is as follows:—

℞. Pulv. benzoini, ℥iiiss; pulv. aloes purif., gr. cclx; pulv. styracis, ℥iiss; bals. tolutani, ʒij–℥j; alcoholis, q. s. ad Oij.

A powder can be made from this preparation by pulverizing the mass resulting upon the evaporation of the alcohol.

Benzoin is antiseptic, protectant, and slightly stimulating. Its peculiar aroma is agreeable to most persons, and renders the local use of benzoin available in affections of the respiratory mucous surface. It is moderately stimulating to granulating surfaces and open wounds. Benzoin makes no toxic impression. Benzoic acid (*q. v.*) is more inviting than the resin.

General Surgery.—The principal preparation of benzoin in common use is the compound tincture. When this is applied to the skin (as with a brush), the alcohol soon evaporates, leaving parts covered with a film of benzoin, which, if sufficiently thick, makes a good protectant. The compound tincture has been recommended (Ashhurst and Bryant) in the treatment of compound fractures, a small piece of lint being saturated with the preparation and placed over the wounds. It is largely used in the same way to close punctures in the skin after tenotomy. Compound tincture of benzoin, in conjunction with collodion, makes a reliable means of retaining dressings on small wounds, *e.g.*, those of the face, the scalp, etc. Such a preparation can be made by evaporating the compound tincture to dryness in a water bath, and redissolving the residue in collodion. Its efficacy is increased by introducing a few fibres of cotton or fine gauze, after the first layer is painted over the selected surface and then covering all with a second coating. We frequently add to it iodoform, which it dissolves, thus increasing the antiseptic properties of this agent.

Diseases of the Skin.—R. W. Taylor has employed the compound tincture of benzoin as a vehicle for the application of bichloride of mercury in RINGWORM OF THE THIGHS, etc. His formula, which we have used with satisfaction, is as follows: ℞. Hydrarg. bichlor., gr. ij–iv; tinct. benzoin. comp., f℥j. M. A brush is passed through the cork and the solution is painted on the affected part once or twice daily.

The compound tincture of benzoin relieves the irritation accompanying FROSTBITE; it is in like manner used with success in CHAPPED NIPPLES. Equal parts of the compound tincture and glycerin form an available application for CHAPPED HANDS AND LIPS.

Diseases of the Nose, Throat, etc.—Benzoin is used in the respiratory tract in the form of the powdered gum, the compound tincture, and benzoated lard.

Michel, of Hamburg (*59. Versammlung der Deutschen Naturforscher und Aerzte*, 1886), believes that when applied to the nostrils pulverized benzoin may check the evolution of WHOOPING COUGH. But since he recommends that a small proportion of nitrate of silver and sulphate of quinine be added, it becomes difficult to ascertain the impression made by the benzoin.

In the form of the compound tincture, benzoin is largely used in CATARRHAL AFFECTIONS OF THE PHARYNX AND LARYNX. In the form of a gargle eight drops to an ounce of water are recommended to obtain a minimum impression. Equal parts of the tincture and water may be prescribed, the patient diluting to suit the taste. In the form of inhalation forty to sixty minims are added to a half pint of water at 145° F. It can be used freely. The indications for the above fluid preparations are either acute inflammation or the relaxed condition which is often found at the end of an acute attack. It is, moreover, valuable in the irritability of the general mucous surfaces of the throat attending inflammation of any grade. In vocalists who suffer from hoarseness, the result of over-use of the throat, it is one of the most popular of remedies. The tincture makes a good application to spongy gums.

M. Mackenzie uses a solution of one part of gum benzoin to five parts of spirit as a varnish to DIPHTHERITIC DEPOSITS; the membrane should be first dried with blotting paper before the application is made.

F. Barker found the tincture of benzoin promptly efficacious in the EPISTAXIS of young children after other remedies had failed. The application is followed by some pain, both in the nose and the ear of the affected side, which soon passes off. The compound tincture mixes well with glycerin and cosmoline. In the latter form it has been used by A. S. Houghton (*Jour. Am. Med Ass'n*, Nov. 7, 1885) as an inhalant.

A. Kebbell (*Brit. Med. Jour.*, Feb. 28, 1885) claims that to hold a bottle containing tincture of benzoin to one nostril and close the other, the patient inspiring deeply, relieves troublesome symptoms and cuts short attacks of acute coryza.

Inhalations of benzoin are very popular in acute catarrhal inflammation of the upper respiratory passages. The compound tincture is ordinarily used in the proportion of one drachm to a pint of water at 140° F. The sedative action is increased by the addition of a half drachm of chloroform. If an increased stimulating effect is desired, a drachm of the oil of the *Pinus sylvestris* may be added (Lefferts). A convenient domestic form of inhalation for acute inflammation of the throat is the following:

Add a teaspoonful of the tincture to a half pint of hot water. A cone, made of paper or some other convenient substance, is placed over the top of the vessel and the steam is allowed to escape through the truncate apex. The mouth is placed over this opening and the steam is inhaled.

The irritation of the fumes of nitrate of potash (*q. v.*) is mitigated by admixture with the vapor of benzoin.

ACIDUM BENZOICUM. Benzoic Acid.

Benzoic acid is made, by sublimation and purification, from benzoin, and, also, by boiling benzoin with an alkaline liquid, thus forming a benzoate and precipitating the benzoic acid therefrom by means of hydrochloric acid. It is also made synthetically from toluol naphthaline and suint, a greasy substance obtained from wool. Pure benzoic acid is inodorous; that prepared from the balsam by sublimation is contaminated with a proportion of an aromatic oil, which gives it the well known odor of benzoin.

"Benzoic acid is soluble in 500 parts of water and three parts of alcohol at 15° C. (59° F.), in 15 parts of boiling water and one part boiling alcohol; also soluble in three parts of ether, in seven parts of chloroform, and readily soluble in disulphide of carbon, benzol, benzin, and oils." (U. S. P.) It forms freely soluble salts with solutions of potassa, soda, and ammonia, and from solutions of these salts is precipitated, by the mineral acids.

Benzoic acid, in solution in the proportion of 1 to 287 (0.348 per cent.), prevents the development of bacteria taken from meat infusion. Its action, however, is feeble compared with that of the other parasiticides, although it is claimed to be fully as poisonous to bacteria as salicylic or carbolic acid.

Benzoic acid is a stimulant, and even an irritant to raw dermal surfaces.

Diseases of the Skin.—Benzoic acid is an excellent local application in URTICARIA. ℞. Acid. benzoic., ʒss; Aquæ, Oj. M.

General Surgery.—Benzoic acid in saturated solution is said to yield excellent results as an injection into old SINUSES.

Diseases of the Nose and Throat.—Benzoic acid in most respects is an exchangeable therapeutic agent with gum benzoin, but it is well to remember that it is more irritating. Owing to its solubility, it is available for lotions. Benzoic acid may be used as a substitute for boric acid. A drachm added to boiling water may be used as an inhalant night and morning in BRONCHITIS and CHRONIC PHTHISIS; it eases cough and lessens expectoration.

A small portion of benzoic acid added to borax and table salt makes an agreeable addition to a lotion for irritative forms of CHRONIC NASAL CATARRH, unaccompanied by tenacious or muco-purulent discharge. The following is a formula for general guidance: ℞. Sodii boratis, sodii chlor., āā ʒij; acidi benzoici, gr. x; ft. chart., No. j. To a half tumbler of water add a half teaspoonful each of the powder and glycerin. Use freely as a lotion.

The irritating qualities of iodine as an inhalant are in a measure controlled by adding 16 grains of benzoic acid to an ounce of the tincture of iodine. A teaspoonful is placed in a pint of water at 140° F. G. M. Lefferts recommends the following for ACUTE ANGINA: benzoic acid three grains; kaolin, twelve grains. Rub together and add tincture of tolu, eighteen drops; water, one ounce. Shake and make up the quantity with water to one ounce. A teaspoonful in a pint of water at 140° F. for each inhalation.

Benzoic acid is recommended by W. D. Miller ("Micro-organisms of the Human Mouth," Phila., 1890) as an antiseptic to arrest dental caries.

Lozenges containing benzoic acid are agreeable in taste and serve a useful purpose in SUBACUTE PHARYNGITIS and LARYNGITIS. Each lozenge contains one-half a grain of the agent. The red balm of Gilead balsam contains benzoic acid and probably derives its efficiency therefrom.

BENZOL (C_6H_6). Benzen. Benzene. Benzole. Phenylhydride.

"Benzol is a colorless, limpid liquid, possessing an agreeable odor. Its specific gravity is 0.85. It congeals at 32° F., and boils at 176° F." (U. S. D.) It dissolves sulphur, phosphorus, iodine, and most resins and fats. It also dissolves some alkaloids, quinine, morphine, strychnia, and others. This is not the article known as benzin, which is obtained from petroleum oil, nor has it any relation to benzoin or benzoic acid. These misapprehensions concerning it are widespread. When benzol or benzene is spoken of in works on chemistry, the substance now under consideration is intended. It is prepared from coal-tar.

Benzol is an active antiparasiticide but does not affect the skin.

Diseases of the Throat, Etc.—A drachm of benzol to the ounce of water is similar in its action to benzoin, but is slightly more stimulating as an inhalant. It may be administered in the presence of a little carbonate of magnesia and six minims of the oil of cassia (Lennox Browne).

BISMUTHI BORAS. Borate of Bismuth.

Diseases of the Nose, Throat, Etc.—Borate of Bismuth infrequently substitutes the subnitrate of bismuth in powders for the relief of catarrhal states of the nose, pharynx, and larynx.

BISMUTHI OLEAS. Oleate of Bismuth.

Diseases of the Skin.—Bismuth oleate enters into the composition of a very excellent soothing ointment, brought into notice some years ago by McCall Anderson, and to which the name of this distinguished dermatologist is given.

McCall Anderson's ointment is composed as follows: ℞. Pulv. bismuthi oxidi, ʒj; acidi oleici, ℥j; ceræ albæ, ʒiij; vaselini, ℥j–ʒj; ol. rosæ, q. s.

The oxide of bismuth and oleic acid are heated together in a capsule until combination takes place, and then the other ingredients are added with stirring. Properly made the ointment should be of the color and consistence of fresh butter, with an agreeable odor. Next to the Ung. diachylon (Hebra) it is the most soothing of ointments.

BISMUTHI OXYCHLORIDUM. Oxychloride of Bismuth.

Oxychloride of bismuth is an impalpable, neutral, insoluble, non-irritating powder. It is preferable to the subnitrate for local use, because of the much greater fineness of its powder, the property that it has of adhering very closely to mucous surfaces, and the fact that it is absolutely non-irritating. Oxychloride of bismuth is the principal ingredient in many cosmetic powders. It gives a peculiar pearly, glossy whiteness to the skin.

Diseases of the Skin.—Bismuth oxychloride has been recommended as an application in CHLOASMA and other pigmentary derangements of the skin.

Diseases of the Throat.—H. McNaughton Jones recommends that a half grain of the oxychloride of bismuth be used in NASAL and PHARYNGEAL INFLAMMATION by insufflation, in two or three grains of powdered starch. M. Mackenzie prefers this salt to the subnitrate.

BISMUTHI SUB-BENZOAS.

General Surgery.—Bismuth sub-benzoate is a white powder with an aromatic odor. It has been introduced by Dr. Fenger (*Lyon Médical*, March 2, 1890) as a substitute for iodoform in the topical treatment ot CHANCRE. A slight burning sensation is experienced upon applying it, but this soon passes away. In from three to six days the chancre assumes a healthy appearance and pursues a rapid progress toward cure.

BISMUTHI SUBCARBONAS. Subcarbonate of Bismuth.

Subcarbonate of bismuth is "a white or pale yellowish-white powder, permanent in the air, odorless, and tasteless, and insoluble in water or alcohol." (U. S. P.)

Diseases of the Throat.—Subcarbonate of bismuth three grains, acetate of morphine one-quarter grain, forms the basis of a pastille, recommended by Whistler in acute and subacute Catarrh of the Larynx, Pharynx, Tonsillitis, etc. It is also employed as a sedative in Laryngeal Phthisis.

For Sub-gallate of Bismuth see *Dermatol.*

BISMUTHI SUBIODIDUM. Subiodide of Bismuth. Iodide of Bismuth. Oxyiodide of Bismuth.

An odorless, tasteless, insoluble, amorphous, light brownish-red powder.

General Surgery.—Subiodide of bismuth was brought into notice by Ogg (*British Med. Jour.*, 1887) as a substitute for iodoform. While inferior to the latter in its effect, it has the advantage as regards odor. In Syphilitic, Chancroidal, or Simple Ulcers it may be applied in powder. When a foul ulcer exists, which cannot often be dressed, it may be packed with the subiodide of bismuth and sealed up.

Diseases of the Ear, etc.—The subiodide of bismuth is by some practitioners preferred to boric acid in the dry treatment of Chronic Otitis Media.

BISMUTHI SUBNITRAS. Subnitrate of Bismuth.

Subnitrate of bismuth is "a heavy, white powder, permanent in the air, odorless, almost tasteless, showing a slight acid reaction when moistened on litmus paper, and insoluble in water or in alcohol." (U. S. P.) It is slightly acid and minutely crystalline.

Subnitrate of bismuth is protectant, sedative, slightly astringent, and antiseptic.

In the treatment of diseases of the skin and mucous surfaces the subnitrate of bismuth is being substituted by many practitioners for the oxychloride of bismuth (*q. v.*).

General Surgery.—Mixed with glycerin to the consistency of a thick pigment and spread on patent lint, subnitrate of bismuth is useful in the treatment of Scalds and Burns. The lint should be covered with oil silk or rubber; or the powder may be dusted over Abrasions and Superficial Wounds. It allays the irritation of the ulceration accompanying an Ingrowing Toe-nail.

Bumstead regards the subnitrate of bismuth as an ingredient of an excellent injection in the last stages of Gonorrhœa. The drug is best administered suspended in mucilage or glycerin. A formula is herewith given: ℞. Bismuthi subnitratis, ʒj; mucilaginis cydonii, f℥ss; Aquæ, f℥vss. M. It is necessary to remember that this preparation will occasionally clog the urethra, and excite uneasy sensation in the part until urine is voided. Subnitrate of bismuth forms the basis of an urethral suppository in the treatment of GLEET, and of a vaginal tampon in the treatment of LEUCORRHŒA. Houghton and King bear testimony to the great value of enemata, in which the drug enters, in TROPICAL DYSENTERY; half a drachm of bismuth subnitrate and half a drachm of powdered acacia should be mixed in two fluidounces of water and injected once or twice daily, according to the severity of the case, the mass to be retained. The severe tenesmus and tormina are relieved in a short time. Trousseau employs one part of the salt with three parts of glycerin as an application to FISSURE OF THE ANUS. The pigment here acts as a foreign body, keeping the sides of the fissure apart and allowing healing to take place from the bottom.

Diseases of the Skin.—Subnitrate of bismuth should not be employed in connection with any sulphur preparation, as this results in staining the skin. In fact, such discoloration occasionally takes place on the face and elsewhere, about the sebaceous follicles, from some reaction between their contents and the drug.

The finely powdered subnitrate of bismuth is employed as a dusting powder, usually alone, but sometimes combined with other powders of similar action, or with simple starch. In INTERTRIGO or CHAFING it is particularly useful; also in some forms of ERYTHEMA, when a powder can conveniently be applied, and in CHAPPED HANDS or NIPPLES. When there is any discharge from the skin, powdered bismuth subnitrate should rarely be used, as it, like most powders under such circumstances, is apt to cake.

Lotions containing bismuth subnitrate are very useful in ERYTHEMA, in erythematous ECZEMA, in inflammatory ACNE, and similar conditions. The following lotion, when the sedative and astringent effect of the bismuth subnitrate is supplemented by the anti-pruritic effect of the prussic acid, is a valuable remedy: ℞. Bismuthi subnitratis, ʒj–ij; acidi hydrocyanici, dil., fʒj; aquæ aurantii flor., ad. f℥iv. M.

In ointment with vaseline or cold cream, in the proportion of half a drachm to a drachm of the bismuth subnitrate to the ounce of ointment, this forms an excellent application in ECZEMA, IMPETIGO, and other inflammatory skin-diseases, accompanied by weeping or suppuration. Its antiseptic properties here find application in preventing infection.

Diseases of the Nose, Throat, etc.—Subnitrate of bismuth may be selected as an agent to give bulk to powders containing iodoform, with the light, flake-like scales of which it easily mixes and enables the substance to be retained upon the surfaces on which there is excess of secretion. One of the favorite uses of the drug is to snuff it up the nostril in ACUTE CORYZA. It gives temporary relief to the sense of distention and heat. The subnitrate of bismuth enters into the composition of *Ferrier's snuff*, in proportion of six drachms of bismuth, two drachms of powdered acacia, and two grains of muriate of morphine. Of this quantity one-quarter to one-half may be used in twenty-four hours, or one part of the drug may be added to acacia, starch, lycopodium, or even Venetian talc (Trousseau). Combined with the yellow oxide of mercury, subnitrate of bismuth is useful in the form of an ointment in ECZEMA of the nostrils. In the treatment of PHARYNGITIS and LARYNGITIS, accompanied with hypersecretion, subnitrate of bismuth is of the same value as in the treatment of CORYZA. Whistler has suggested its use in the form of a pastille. It has been especially recommended in CHRONIC ŒSOPHAGITIS; one pastille can be taken every half hour.

In the proportion of five grains to an ounce of rose water, to which a little glycerine has been added, subnitrate of bismuth is an agreeable mouth wash in SUPERFICIAL GLOSSITIS and in APHTHÆ.

BISMUTHI TANNAS.

Tannate of bismuth is prepared by triturating the moist hydrate from 44 parts of subnitrate of bismuth with 20 parts of tannic acid. After the mixture has stood an hour or two it is washed, and then dried at a gentle heat. The product consists of 53 per cent. bismuthous oxide and 47 per cent. of tannic acid. It is insoluble, and therefore, nearly tasteless.

Diseases of the Nose, etc.—Tannate of bismuth is used by some French physicians as an astringent for the nasal mucous membrane. (*Jour. de Méd. de Paris*, 1890.)

BISMUTHI TRINITRAS. Trinitrate of Bismuth. Bismuth Nitrate.

A crystalline salt deposited from solutions of bismuth in nitric acid. The form in which it is usually used is that of the glycerite, made by dissolving sixty grains of crystallized nitrate of bismuth in one ounce by weight of glycerin without heat. It can be diluted with its own weight of water without precipitation, but larger quantities of water precipitate it.

According to H. McNaughton Jones, the trinitrate of bismuth is an ingredient of *Ferrier's snuff*.

BLEEDING.

General Surgery.—In the pre-anæsthetic days of medical practice, in order to produce muscular relaxation, patients were bled up to the point of syncope before attempting the reduction of a dislocation. To-day bleeding is so seldom practiced that many physicians have never performed or even seen the operation of phlebotomy. Jürgensen, in his exhaustive article on the subject, in von Ziemssen's *Therapeutics*, makes the following statement: "What I have seen of it (bleeding) has been incapable of leaving any doubt in my mind that this treatment is seldom and perhaps never imperative." It is far different from local depletion. Two forms are yet in vogue, viz., leeching, and scarification with cupping.

Leeching.—The use of leeches is indicated when it is desired to abstract blood from localities which, from their position, or from excessive tenderness, makes it difficult to be operated upon by the knife. In order to imitate as near as is practicable the conditions under which these animals secure their food, the skin over the selected locality should be carefully cleansed, especially should all traces of soap be removed, and of such pungent medicaments as turpentine, liniments, etc., otherwise the animals will refuse to bite. A little blood or milk smeared upon the skin will often induce leeches to take hold. Medicinal leeches are of two kinds, the Swedish and American. The former are much the more powerful and, at least in the treatment of adults, are, as a rule, preferred. Each abstracts from one-half ounce to an ounce of blood. The American leech is one-sixth the strength of the European. Where a number of leeches are to be applied, as over the abdomen in nervous persons, where each bite causes alarm, the leeches may be placed in a half tumbler of cold water, and by an adroit movement the tumbler may be inverted on the part and the leeches will attach themselves rapidly; the water may be drained away and caught in a pledget of absorbent cotton. It is not uncommon for leech bites to continue bleeding. This bleeding may be controlled by pressure, Monsel's solution on cotton, styptic cotton, or, if these fail, by the application of the actual cautery. Leeches should not be applied where the skin is delicate or loose, as on the eyelids or scrotum. They are often employed with great advantage in the early stage of PERITONITIS. The application of a dozen Swedish leeches over the distended and tender abdomen, followed by hot poultices, will frequently be followed by the most happy results. In ACUTE SYNOVITIS of the knee joint, accompanied by much pain and throbbing, the application of half a dozen leeches will often be of service, and will assist in cutting short an attack which, under ordinary circumstances, might be of long duration. In PROSTATITIS, accompanied by pain and throbbing, the application of a few leeches to the perineum, in conjunction with other remedies, is often productive of good results. It has been advised by some authorities to apply the leeches to the anterior wall of the rectum, but this requires unusual skill in dealing with these animals.

Cupping.—This mode of securing a local loss of blood is now rarely used, and since, in order to make it efficient, it involves a previous scarification of the skin, the reader is referred for its consideration to works on minor surgery.

While DRY CUPPING is, properly speaking, not a form of bleeding, since the blood obtained by enforced extravasation is again absorbed, the method can be conveniently considered in this place. In dry cupping the blood is brought to the surface by the application of a hollow glass bell, from which the air has been exhausted. Various forms of cupping apparatus, which, however, are soon liable to get out of order if not kept in constant use, are offered for sale. An ordinary stout drinking glass serves a convenient purpose. A little cotton or a few drops of alcohol are placed within it (if the agent last named is employed, it must not be in amount sufficient to run down to the sides) and then ignited. While this is burning the glass is placed on the desired spot. The instant it touches the skin the flame is extinguished and the glass adheres firmly; in a few moments the integument is deeply drawn into the mouth of the vessel, and soon the blood will be seen approaching the surface, leaving a dark welt beneath the skin. The glass should remain in position from five to ten minutes. If many small hairs are on the skin the cup will not hold well, as a slight amount of air will leak in, causing it to lose its grasp. Dry cupping of the chest is often of service in the early stages of PNEUMONIA. We have seen patients unable to lie down, with hurried respiration, and face flushed, after the application of half a dozen large cups over the surface of the chest, assume the reclining position and pass into a quiet sleep. If the individual be thin, and the ribs prominent, large cups will not adhere, and smaller ones must be employed. Under these circumstances narrow-mouthed ale glasses will be found satisfactory. In NEPHRITIS and RENAL CONGESTION accompanied with suppression of urine, dry cupping over the loins will often be followed by good results. Four or five large cups will suffice.

Diseases of the Ear, Nose, and Throat.—The abstraction of blood from the ear is confined to the region of the tragus. It is true that incisions are made on the lining membrane of the external auditory meatus or the tympanic membrane, but in these localities the removal of the blood is incidental.

Blood is ordinarily removed by leeches for the relief of ACUTE OTITIS MEDIA. From a half ounce to an ounce may be taken. The relief obtained by this simple procedure is often great and not infrequently aborts an acute attack. Should the tension and pain be due to accumulation of mucus in the tympanic chamber the procedure does not take precedence of paracentesis.

Bleeding is of use in the treatment of CHRONIC NASAL CATARRH. As a rule the form associated with hypertrophy of the mucous membrane presents the best indications for depletion. That this statement is not without exceptions is evident from the fact that the blood-vessels in the forms in which the parts are atrophied are often distended in parts with venous blood. However we may explain the fact, the conclusion is temperate that in both of the above-named forms of chronic nasal disease the local loss of blood not infrequently is followed by marked benefit to the patient. In HYPERTROPHIC CATARRH the blood is removed by pricking here and there the distended surfaces. This ordinarily is best accomplished at the anterior end of the inferior or of the middle turbinated bone, as well as the region which answers to the line of junction of the triangular cartilage with the perpendicular plate of the ethmoid bone. In ATROPHIC CATARRH the points to be selected for depletion are almost uniformly on the septum, pretty well up and directly in front of the middle turbinated bone. In order to obtain relief the parts must bleed rather freely, that is to say, from two drachms to a half ounce or even an ounce. The hemorrhage generally stops spontaneously. If the parts are depleted a second or third time—in intervals let us say of a week—the amount of blood lost is never so large as at the first bleeding. In lithæmic persons, particularly in high livers, it is remarkable how prompt and permanent is the relief which is sometimes obtained by single bleeding. So far as we have observed subjects of the class named generally exhibit the signs of catarrh of the congested hypertrophic type.

Some forms of TINNITUS AURIUM accompanied with congested states of the ears are best treated by local depletion from the middle turbinal at its posterior part. The parts selected should be thoroughly cocainized and the knife carried well back to the end of the turbinal as seen from in front. The temporary character of the benefit in this way secured indicates that a tinnitus due to structural changes in the middle ear is greatly intensified by the condition of the associated vessels.

We are led to believe that a great deal of the relief which is obtained by intra-nasal operation, especially in conditions where the amount of interference seems to be out of proportion to the results obtained, can be attributed to the free loss of blood which accompanies the operation.

W. C. Glasgow (*Trans. A. Laryng. Ass'n*, 1887, 150) recommends systematic depletion of the nasal mucous membrane for FRONTAL HEADACHE of congested type, associated with nasal disease. A simple bleeding may serve to relieve the headache, or the bleeding may have to be repeated in a week or a month. Dr. Glasgow has seen few cases which were not relieved by such local extraction of blood. The amount lost at each sitting rarely exceeded one ounce. W. H. Daly (*Trans. Am. Laryng. Ass'n*, 1888, p. 192) resorts to systematic depletion of the nasal mucous membrane in CHRONIC NASAL CATARRH, extracting from one-half to three ounces of blood at a sitting. He reports by this unaided treatment results of reduction of tissues, restoring normal nasal respiration.

Scarification is often resorted to for relief of tension and pain in ACUTE

PHLEGMONOUS TONSILLITIS. The large superficial tortuous veins which lie at the base of the tongue in old people are opened with benefit in CHRONIC PHARYNGITIS.

Intra laryngeal scarification is occasionally employed in ACUTE LARYNGITIS of high grade, accompanied with products of infiltration. The incisions for the relief of ŒDEMA OF THE GLOTTIS incidentally relieve by the moderate loss of blood which follows upon the incision.

Diseases of the Eye.—General bleeding is not often called for in the treatment of diseases of the eye, but the local abstraction of blood is useful in many cases. It is accomplished by means of leeching or by the use of the artificial leech of Heurteloup. From two to four leeches may be applied to the temple; not too near the eye and never on the lids, as they produce œdema and ecchymosis of the delicate and loosely attached skin, and the bites sometimes excite excessive irritation. The artificial leech is really a cupping instrument in which a long glass cylinder is substituted for the ordinary cup, and the air is exhausted by a piston worked with a screw. It draws blood much more rapidly than do leeches, and is considered more efficient than leeching, particularly when it is desired to affect the deeper circulation of the eye. The patient should be kept quiet in a darkened room for some time afterward. Frequent repetitions are often necessary. The effect of local bleeding is most marked in IRITIS, but it is often useful in ACUTE CHOROIDITIS and RETINITIS. Repeated applications of the artificial leech are recommended by some surgeons in the treatment of the CHOROIDITIS of PROGRESSIVE MYOPIA. In case of rapid increase of myopia with symptoms of irritation, one or two ounces of blood may be taken every three or six days for several weeks, the patient abstaining from all use of the eyes, and remaining in a darkened room or going about with smoked glasses.

BOUGINARIA. Bougies.

General Surgery.—Medicated bougies will be found of service in the treatment of certain inflammatory conditions of the mucous membranes, especially those of the genito-urinary tract, and of the rectum. They will often succeed when other methods fail. The object of the use of bougies is to keep the mucous surfaces apart, and at the same time to apply the selected medicament to advantage. For this purpose Charles L. Mitchell, Manufacturing Chemist of Philadelphia, has introduced to the drug trade various forms of medicated gelatine bougies. As a base gelatine is preferable to cocoa-butter, since it does not become rancid, and, owing to its animal nature, is more readily absorbed. Urethral bougies are manufactured for use in the treatment of GONORRHŒA, GLEET, etc., in two sizes, six and one-half inches and three inches. The diameter is three-sixteenths of an inch. The longer variety presents advantages in cases where the whole of the mucous membrane of the urethra is involved. Bougies should be used but once a day (on retiring), and may be applied by the patient. The surface of the bougie should be moistened. A "bougie-hood" is a convenience, and is a necessity to preserve cleanliness. In the treatment of SUBACUTE GONORRHŒA the bougie may be medicated, as follows: Sulphate of zinc, gr. ¼; carbolic acid, gr. ⅛; hydrastis canadensis, gr. 1; extract of belladonna, gr. 1; fluid extract of gelsemium, gr. ½. For treatment of UTERINE CATARRH and DYSMENORRHŒA, medicated intra-uterine pencils are recommended. They are short, yet possess sufficient elasticity to permit a certain amount of force in their introduction. The large pencils (3 inches in length and $\frac{3}{16}$ in diameter), are employed in cases of PUERPERAL UTERUS, CHRONIC CATARRH, etc., where the os is patulous, the cervical canal dilated, and the womb enlarged. The small pencils (3½ inches in length and $\frac{1}{10}$ in diameter), favored by Engelmann (*Weekly Med. Rev.*, March 14, 1885), are designed for use in CERVICAL CATARRH and DYSMENORRHŒA, where the uterus and cervical canal are normal in size or nearly so. They are applied by the ordinary long dressing forceps or a special "carrier." VAGINITIS and LEUCORRHŒA are successfully treated by means of a hollow vaginal suppository which is two and one-half inches in length and one inch in diameter. Cotton may be inserted to enable them to hold their form. A suppository so shaped possesses distinct advantages; its lightness allows its retention until completely absorbed; it does away with a great amount of unnecessary material which interferes with cleanliness; it melts slowly, and the cotton maintaining the shape increases the therapeutic effect of the drug; it can be introduced by the patient. For INTERNAL HEMORRHOIDS, CATARRHAL STATES and ULCERATION OF THE RECTUM, a rectal bougie is used. Each bougie is cigar-shaped, and is thus adapted for insertion and prevented from slipping out. The mass is sufficiently large to distend the rectum and relieve the congestion of the veins and the muscular irritability so commonly met with in diseases of the rectum. Antiseptic treatment of FISTULÆ has been provided for by the manufacture of "iodoform fistula crayons." By their continued use a cure is often obtained without recourse to operation. The crayons are made in various sizes. They contain 33 per cent. of iodoform mixed with a compound of gelatine and glycerine. They are very flexible, and may be introduced into the most tortuous tract. Preparatory to using, the crayon should be oiled and then inserted with a twisting movement. The projecting end is then cut off and the suppository held in place by an iodoform pad.

Diseases of the Ear, Nose, etc.—Bougies act in two ways. First by retaining for a much longer time than can be in any other manner secured the contact of medicinal agents upon the diseased surfaces and secondly by exerting more or less pressure against inflamed tissues. Medicated bougies are little used for the purpose of medicating the Eustachian tube. Unguents smeared upon the tip of an Eustachian catheter answers the limited indications for such medicament. In the nasal chambers they have a wider range of usefulness. They are often employed to dilate the lower part of the nasal passage and when composed of dissolvable substances, require no subsequent attention. (See *Oleum Theobromæ* and *Gelatin.*) A gelato-glycerine bougie is described by G. H. Mackenzie (*Br. Med. Jour.*, May 16, 1885). G. Catti (*Allgemeine Wiener Medizinische Zeitung*, June, No. 26, 1876), has called special attention to the subject of nasal bougies. Each bougie should be from eight to twelve centimetres long and four to six millimetres in width, and one end somewhat thinner than the other. Since the depth of the nasal passage varies in different individuals it is necessary to have the bougie no longer than the distance between the anterior and posterior opening; this can be determined by careful rhinoscopic inspection. Bougies should remain in the nose from one to four hours; at the end of this time the substances are, in the main, dissolved. A small piece of absorbent cotton should be placed in the nostril in order to prevent an outflow of mucus.

BRAN.

The ground husk of the wheat grain mixed usually with a very small proportion of starch. It constitutes from one-quarter to one-third of the weight of the grain.

General Surgery.—Owing to its convenience and cheapness bran makes a serviceable surgical dressing for the treatment of compound FRACTURES. Barton's bran dressing is particularly useful in compound fractures of the leg accompanied with much discharge. It is thus applied: Inside of an ordinary fracture box of suitable size is placed a sheet of oil-cloth, or in its absence a piece of muslin; on this a layer of fine, clean bran is spread about two inches deep. The fracture being reduced, the limb is laid in the box with a pad of cotton placed beneath the tendon Achillis and round each malleolus; a layer of the same material surrounds the limb below the knee. The sides of the box are then brought up and secured, and more bran is dusted and packed about and over the leg until the box is filled. The fractured limb is thus evenly supported on all sides. Over the wound or broken skin any suitable dressing may be applied. Once a day the sides of the box are let down, and without disturbing the limb the solid bran is removed with a spoon and replaced with fresh material.

The bran dressing makes firm and equable pressure, and controls the tendency to hemorrhage. It can be employed in conjunction with the antiseptic method, the limb being first dressed with the antiseptic gauze, and the bran packed around the limb as above directed.

In the treatment of simple fractures of the femur, long, thin bags filled with bran may substitute sand bags as padding for the long splint of the Liston apparatus. We have found that good support may be given to the limb by the use of a bran bag with this splint running from below the ankle to the axilla, and the short splint passing from the ankle to the perineum and retained by means of a splint cloth.

In the absence of the air-pillow, small, circular pads may be made and filled with bran and placed under the back to relieve pressure, for the prevention of bed-sores.

In OBSTETRIC PRACTICE a shallow bag made of cheese cloth and filled with bran will be found a satisfactory means of absorbing discharges. It may be placed over the rubber sheet. At the termination of the labor it is readily slipped from under the patient, leaving the bed clean and dry. It is superior to old blankets and comfortables, such as are ordinarily used for this purpose. A flat bag filled with bran and heated in an oven is a satisfactory means of applying dry external heat and a good substitute for the rubber hot-water bag. It is light and easily borne, and adapts itself to all parts of the surface of the body where it may be placed. Dry, external heat may be applied to the trunk in this way in the treatment of shock; it assists in hastening reaction, and adds to the comfort of the patient.

BROMOFORM.

Bromoform ($CHBr_3$) is produced by the action of bromine on alcohol in the presence of an alkali. It is a colorless liquid boiling at 151° C and solidifying at 2.5 C. Its specific gravity is 2.83 at 10° C." (U. S. D.)

Diseases of the Throat.—S. Solis-Cohen commends the use of bromoform in FOLLICULAR TONSILLITIS as well as in OZÆNA.

BROMOL. Tribromphenol.

Bromol is formed in the well-known test for phenol by the use of bromine water. On the addition of bromine water to a dilute aqueous solution of phenol, a crystalline precipitate of tribromphenol is formed. It has the formula $C_6H_2Br_3OH$, in which three atoms of bromine replace three atoms of hydrogen in phenol.

Bromol is a white, crystalline solid, melting at 95° C. It is insoluble in water, but freely soluble in alcohol, ether, chloroform, and glycerin.

This substance has been recently recommended by Rademaker as an antiseptic.

General Surgery.—Grimm has shown that when applied to recent WOUNDS bromol has an irritating, almost caustic, effect. In TUBERCULOUS ULCERATION granulations are stimulated. Rademaker (*Therap. Monatshefte*, No. 3, 1891) dusts the powder on the ulcer, or employs it in a solution in olive oil, 1–30, or in ointment 1–10.

BROMUM. Bromine.

"A liquid, non-metallic element obtained from sea water and from saline springs." (Ph. Br.) "Bromine is a volatile liquid of a dark-red color when viewed in mass, but hyacinth red when viewed in layers. Its taste is caustic, and disagreeable. It boils at about 63° C. (145.4° F.), forming a reddish vapor resembling that of nitrous acid." (U. S. D.) It dissolves in thirty-three parts of water at ordinary temperatures, but is more soluble in alcohol, ether, chloroform, and bisulphide of carbon? It dissolves freely in aqueous solution of bromide of potassium, and a solution so made is available for external application.

Bromine is a caustic. Its fumes are violently irritative to the respiratory tract and their presence in the air excites lachrymation. The odor is intolerable to most persons.

General Surgery.—Bromine finds its most important use in general surgery as an escharotic. Bonnet and Glover were the first to call attention to this agent as a substitute for iodine in the treatment of scrofulous conditions, but experience has failed to establish its usefulness.

Goldsmith introduced it in the treatment of HOSPITAL GANGRENE during the late civil war. Probably no topical application has greater effect in arresting the advance of this disease. D. H. Agnew commends its use in the highest terms, but advises that preliminary to its application the patient be etherized; then all disorganized tissue should be removed with a pair of scissors and forceps, and the parts washed with a disinfectant. Next a mop or swab, made by fastening a piece of lint or cotton on the end of a stick, should be dipped in undiluted bromine and worked into all the interstices of the slough; or, if this is too compact, it should be broken up with a director, or a pair of dressing forceps be thrust in and opened, and a small quantity of the bromine injected into the opening from a small glass syringe. Where the parts are rapidly breaking down, as in the ulcerative variety, the simple application of bromine to the circumference of the diseased tissue will be sufficient to arrest the destruction.

Bromine may also be used in the form of a vapor, the surface to be acted on being covered with dry lint, upon which is placed a cloth dipped in pure bromine, and the whole covered with oiled silk. Bromine acts by producing an eschar, the separation of which may be hastened by enveloping the part in a charcoal poultice. As a topical application in CANCER OF THE UTERUS and other FOUL ULCERS, a solution of bromine in alcohol has been recommended by Routh and others. Bromine is also used in GANGRENOUS VULVITIS and in some forms of PHAGEDÆNA. In the main acid nitrate of mercury will usually fulfill the indications of bromine while possessing none of its disagreeable properties.

Diseases of the Throat, Nose, etc.—The vapor of bromine is claimed by Potter to have value in the treatment of NASAL CATARRH.

Bromine in a pure form, or in any of the proportions proposed by Goldsmith, is not available for treatment of the mucous surfaces. One of us instituted a series of observations on the effect of bromine on indurated nodules of the pharynx. Small glass tubes of the pattern seen in the Zaufal speculum were employed and a cotton carrier, the end of which was wrapped with a pledget of cotton, was inserted into the pure bromine, and introduced into the tube, which, being carried to the selected spot, enabled the observer to bring the cotton against the pharynx without permitting the fumes to escape. The application caused a yellowish-white coagulation on the membrane, which was quite superficial, and produced a shallow impression on the parts as compared with any one of the caustic agents described elsewhere. (See *Chromic Acid*, *Caustic Potash*, and *Caustic Soda.*)

Its value as an application to DIPHTHERITIC DEPOSITS must be quite secondary. In young children its use would not be free from danger. Bromine fumes can be conveniently employed in solutions of bromide of potassium. Two parts each of bromine and bromide of potassium are added to one hundred parts of water. A sponge is saturated with the fluid and the fumes inhaled in DIPHTHERIA, and PHAGEDÆNA of the throat. Ozanam recommends a proportion of one grain of bromine to five of bromide of potassium.

BRUCINE.

Brucine is an alkaloid obtained from *Nux vomica*, and from the bark known as *false Angustura bark*. It is without odor, but of a permanent, harsh, and bitter taste. It is soluble in eight hundred and fifty parts of cold and five hundred parts of boiling water, very soluble in alcohol, whether hot or cold; but insoluble in ether and the fixed oils, and only slightly dissolved by the volatile oils.

Brucine is analgesic.

Diseases of the Ear, Throat, etc.—C. H. Burnett (*Trans. Amer. Otolog. Society*, 1885) and Seiss (*Therapeutic Gazette*, Jan. 1886) use a five per cent. solution, applied by a cotton pledget in FURUNCLE OF THE EXTERNAL MEATUS and SUPPURATION OF THE EAR. The effect is more lasting but less certain than that of cocaine. According to T. J. Mays a five per cent. solution of brucine applied to the mucous membrane of the mouth caused insensibility of the part. A twenty-five per cent. solution obtunded the normal sensibility of the skin of the back of the hand.

A solution thus prepared may be painted over a superficial ABSCESS prior to making an incision; but brucine is inferior in this respect to cocaine and rhigoline.

BRYONIA.—Bryonia. Bryony.

"The root of *Bryonia alba*, and of *Bryonia dioica*, Linné." (U. S. P.) The *Tincture of Bryonia* is official.

Diseases of the Nose, etc.—Bryonia is probably hæmostatic and like in its action to ergot and hamamelis. In this way it is likely it may be made of use in EPISTAXIS. (*Jour. de Méd.*, 1891.)

CADMIUM IODIDE. Iodide of Cadmium.

Iodide of cadmium occurs in large, white crystals, soluble in water and alcohol. The reaction is acid.

Cadmium iodide possesses the therapeutic properties of iodine and the advantage of not staining the skin.

General Surgery.—The drug may be prescribed in the form of an ointment, a drachm to an ounce of cosmoline or lanoline, with advantage in the treatment of ADENITIS (Garrod), whether strumous or sympathetic. The preparation is bland in character, and iodine is freely absorbed. It is preferable to the ointment of iodide of lead, which in sensitive subjects may cause lead poisoning. Applications may be applied at night and washed off the following day.

Diseases of the Ear, Mouth and Throat.—A wash of two grains to the ounce of water is recommended for otorrhœa. Iodide of cadmium may be used upon indurated states of the oral mucous membrane in the strength of seven grains to two drachms of collodion. (J. W. White, "Dental Therapeutics.")

CAFFEA. Coffee.

"The seed of *Caffea arabica*." (U. S. P.) The most important constituent is the alkaloid, *Caffeine*. The article usually sold as caffeine is really theine, with which caffeine is chemically and therapeutically identical. *Theine* is obtained from different varieties of *Thea*, usually from parts of cargoes which have been spoiled for domestic use in transit, by wetting or other misadventure.

In the process of roasting, coffee loses considerable moisture, which carries with it some caffeine, the fat, sugar, and tannin are destroyed, and some empyreumatic volatile oils are produced. Thoroughly ground and freshly roasted it is protectant, moderately analgesic and deodorant. Lüderitz (*Berlin. Klin. Wochenschrift*, March, 1890) found that in a pure infusion growths of bacteriological origin were rapidly destroyed. A cup of coffee left in a room remains almost free from micro-organisms for a week or more. The antiseptic property of coffee is probably not due to the caffeine but to the empyreumatic oils developed by roasting. (*Jour. Amer. Med. Ass'n,* 1890, p. 692.)

Diseases of the Ear, Throat, etc.—Coffee is in good repute as an agent to cover the odor of iodoform. M. Gougenheim (*Le Progrès Médicale,* Oct. 31, 1885, p. 337) employs it for its analgesic properties in LARYNGEAL PHTHISIS. F. Guerder (*Brit. Med. Jour.,* July 31, 1886) adds to dried, finely pulverized coffee an equal proportion of boric acid as an insufflation in WHOOPING COUGH. H. McNaughton Jones recommends for AURAL ECZEMA an ointment of iodoform and fresh coffee one part, glycerine and oil of almonds each two parts, and vaseline ten parts.

CALCII CARBONAS PRÆCIPITATUS. Precipitated Carbonate of Calcium. Precipitated Chalk.

Precipitated carbonate of calcium is made by the mutual decomposition of solutions of carbonate of sodium and chloride of calcium. "A very fine, white, impalpable powder, permanent in the air, odorless and tasteless, and insoluble in water or alcohol." (U. S. P.)

CRETA PRÆPARATA. Prepared Chalk.

"Native friable carbonate of calcium, freed from most of its impurities by elutriation." (U. S. P.) It usually occurs in the form of small cones of a dirty white color, soft, free from grit, and readily pulverized under the fingers. It is an impure carbonate of calcium, containing a proportion of magnesium salts, usually a small proportion of iron salts, and some sulphate of calcium. Precipitated carbonate of calcium is a purer product, and hence is preferable for most purposes.

Chalk is employed as a desiccant and mild astringent, also as a mild alkali to neutralize acids and to assuage the irritative effects of fatty decomposition.

General Surgery.—Precipitated chalk is often used in dusting-powders, and as a desiccant and protective application to old BURNS and ULCERS. Dr. Hood (*Lancet,* October 1, 1887), recommends the following ointment for the treatment of CANCER as bland and unirritating: ℞. Cretæ præpar., ʒiij; olei amygdal., ʒij. The chalk is to be intimately mixed with the oil, then two ounces of lanoline are to be added. This may be applied twice daily, spread on lint.

Diseases of the Skin.—The dry powdered chalk is an ingredient of several powders employed in ERYTHEMATOUS ECZEMA, particularly about the genitalia where the free secretion of sweat and the natural heat of the parts tends to keep up irritation and to hasten the decomposition of such applications as may be made. The rapid formation of fatty acids in these localities makes it desirable that ointments and powders should contain some alkali, or they may do harm by their rapid decomposition.

For the same purpose powdered chalk is employed in soothing, astringent washes as one of the ingredients. (See *Zinci carbonas*, *Zinci oxidum*, *Bismuthi subnitras*). The following excellent lotion of Startin, used in Eczema and Acne, is an example of the use of chalk in this connection: ℞. Pulv. zinci carb. præcipitat., ʒj; pulv. cretæ præparatæ, ʒj; glycerini fʒiij; acid. hydrocyanic. dilut., fʒss; liquor. calcis, f℥iij; aquæ rosæ, ad. f℥viij.

Prepared chalk enters into the composition of an ointment somewhat similar to the *ung. cretæ comp.* of the old London pharmacopœia, which is said by Liveing to be an excellent preparation. It is composed as follows: ℞. Emplast. plumbi, ʒvj; ceræ flavæ, ʒj; olei olivæ, fʒv. Dissolve together and add, stirring constantly, the following: Cretæ præparatæ ʒiij; acid. acetic. dilut., fʒj., the dilute acetic acid being first mixed with the chalk. This is employed in Irritable Subacute Eczema.

The addition of a drachm of prepared chalk to an ounce of lard makes a convenient chalk ointment, and chalk also enters into the composition of Wilkinson's ointment as an adjuvant (see Picis).

Sir Dyce Duckworth has recommended the following "*chalk ointment*" as an excellent application in Erysipelas: ℞. Cretæ præparat. *seu* cretæ præcipitat., adipis āā ℥j. M. The lard should be melted and the chalk slowly added and beaten in. Lard will take up two and a half times its weight of chalk, but the even proportions make a better ointment. Half a drachm of carbolic acid to the ounce may be added. This ointment is applied, by means of the finger, to the affected parts, which are then covered with plain lint or boric lint.

Diseases of the Mouth, Throat, etc.—Carbonate of calcium, forms the basis of many dentifrices on account of its antacid and astringent action on the gums and the mucous membranes of the buccal cavity. Garretson recommends the following formula as a tooth powder: ℞. Cretæ præparatæ; pulv. iridis Florentinæ, āā ℥ss; pulv. ossis sepiæ, ʒij; olei limonis, q. s.

Prepared chalk enters into the composition of a lozenge used to overcome Acidity of the Mouth and Pharynx. Each lozenge contains four grains of the agent.

CALCII CHLORIDUM. Chloride of Calcium.

"Chloride of calcium deprived of its water by fusion at the low red heat. It should be preserved in well-stopped bottles. It is in colorless, slightly translucent, hard, and friable masses, very deliquescent, odorless, having a hot, sharp, saline taste, and a neutral or faintly alkaline reaction. It is soluble in one and five-tenths parts of water, and eight parts of alcohol at 15° C (59° F.); very soluble in boiling water, and soluble in one and five-tenths parts of boiling alcohol." (U. S. P.)

Diseases of the Skin.—Chloride of calcium is employed in solution as a sedative lotion in ECZEMA. It forms the chief ingredient in some German mineral waters, and is more employed in Germany than elsewhere. It is the clear fluid which remains when the sediment of oxide of mercury is allowed to settle in lotio nigra; and probably some, if not a large part of, the virtues of that lotion may be due to the solution of chloride of calcium.

CALCII HYDRAS. Hydrate of Calcium. Hydrate of Lime. Slaked Lime.

Slaked lime is made by pouring one part of water on two parts of lime in a metal vessel and permitting it to cool. The product should be preserved in well-stopped bottles.

Slaked lime is a solvent and antacid. It also appears to act mechanically in breaking up exudates.

Diseases of the Skin.—Slaked lime is one of the ingredients of Spender's *lime ointment*, which is made by incorporating four parts of washed slaked lime with one part of fresh lard and three parts of olive oil previously warmed together.

Diseases of the Throat, etc.—Slaked lime has long been popular in this country as a remedy in MEMBRANOUS CROUP and DIPHTHERIA for removing the exudation from the throat. It has been advocated in the main by J. Solis-Cohen.

In order that the fumes arising from the slaking of lime shall be efficient in removing the membranes from the trachea, it is necessary they should be copious. The action appears, according to Dr. Geiger, of Dayton, Ohio, to be mechanical, small particles of lime drying up the edges of the partially detached shreds so that the watery vapor gets under to accelerate the separation. Cohen directs that several lumps be placed in a bucket which is carried to the bedside of the patient and hot water poured upon the masses until they are barely covered. A funnel-shaped newspaper or a stout bag with one corner cut off should be placed over the vessel with the outlet directed toward the patient's mouth. The eyes should be protected. If cough or emesis is excited large quantities of membrane may be expelled. Inhalations should be repeated every half hour or oftener.

CALCI HYPOPHOSPHIS. Hypophosphite of Calcium.

Diseases of the Lungs.—An inhalation of the hypophosphite of calcium when mixed in the proportion of one ounce of the salt to an equal quantity of glycerine in three ounces of water is recommended by A. S. Houghton (*Journal of American Medical Association*, November 7, 1885).

CALCII PHOSPHAS PRÆCIPITATUS. Phosphate of Calcium.

Phosphate of calcium is prepared by digesting burned bones with diluted hydrochloric acid, and treating the filtered solution with ammonia water, which precipitates the phosphate in a finely divided state. The precipitate is then well washed, to remove the soluble ammonium chloride which is formed at the same time. Phosphate of calcium should dissolve completely in hydrochloric or nitric acid without effervescence.

General Surgery.—Doubenski (*Bul. Gén. de Thérap.*, vol. i, 1890), and others have used the phosphate of calcium with a little free phosphoric acid, one to one hundred, in the treatment of TUBERCULOUS ULCERATIONS, and succeeded in effecting a cure where other remedies had failed. Non-ulcerated infiltrated masses were injected, with the object in view of inducing calcification of tuberculous products. In many cases the results were satisfactory. COLD ABSCESSES and FISTULOUS TRACTS were treated by packing with gauze soaked with the solution of five parts to one hundred.

Diseases of the Nose, etc.—M. Mackenzie recommends phosphate of calcium to give bulk to powders to be used as snuffs or other insufflations.

CALCII SULPHAS. Sulphate of Calcium. Gypsum. Plaster of Paris.

The Ph. Br. directs that this salt be made from the native sulphate of calcium by dehydrating it by heat. As found in commerce it is a white powder, nearly insoluble in water, and having the property of solidifying with even so much as twice its weight of water, and of expanding during the solidification.

General Surgery.—Plaster of Paris is one of the most important articles employed in many of the fixed dressings, intended to correct deformities or to retain the ends of broken bones in apposition. A common way of using it for this purpose is in what is known as the Bavarian splint, which is made by pouring liquid plaster between two pieces of blanket or flannel previously fitted to the injured member, and united by a seam at the part which goes to the back. In fracture of the leg the limb is placed on the blanket, the inner layer of the dressing material is brought up and pinned in the front of the shin and on the dorsum of the foot. The bones are then put in position, a slip of bandage confines the upper, while a second and separate piece holds the lower part of the blanket or flannel, thus making, as it were, two closed sacks, one on each side of the limb. Plaster of Paris is now mixed with water to the consistency of thick cream, and quickly poured in between the folds of the blanket on either side. Before the plaster sets the surgeon can readily mold it evenly over the surface of the limb, after which the entire mass may be retained by a few additional turns of bandage and allowed to dry. When it is desired to inspect the parts, all that is necessary is to cut the turns of the bandage and pull the edges of the plaster asunder, when the two halves fall apart,—the seam at the back acting as a hinge. Swelling of the limb is thus accommodated by the hinge behind and the opening in front, and the danger of undue pressure avoided. Should an external wound demand an opening in the plaster, it can readily be made by cutting a window in both thicknesses of blanket, and stitching their edges together to prevent the escape of plaster. This form of fixed dressing is the only one which should be applied to a recent fracture.

The plaster-of-Paris bandage or roller is made by thoroughly incorporating plaster of Paris with the mesh of a loose texture, such as cheese-cloth or crinoline, the latter being most commonly employed. The fibre is then made into a loose roller or bandage, from three to five yards in length, containing a small amount of plaster between the folds. When this is to be used, the limb is covered with a close-fitting stocking or bandage, and the plaster roller is submerged in water, and, when thoroughly soaked, is removed and squeezed as dry as possible, and applied in spiral turns around the limb. When the application is complete the dressing is covered with a little dry plaster of Paris. Such a bandage has the advantage of becoming firm in from fifteen minutes to a half hour, and constitutes one of the best forms of immovable dressing. It is well suited to all fractures of the leg after the inflammatory swelling has subsided. If the plaster is old, the hardening process may be hastened by the addition of a small handful of salt, or by placing the plaster in an oven in a shallow pan (for a few hours before using) until it is thoroughly dry.

CALENDULA. Marigold.

"The fresh, flowering herb of *Calendula officinalis*." (U. S. P.) The only official preparation is the tincture made by displacing twenty parts of the herb with sufficient alcohol to make one hundred parts.

Calendula is a weak astringent.

General Surgery.—The bruised leaves, made into a poultice, have been applied with asserted advantage as a dressing for painful CANCERS of the breast. A tincture has been used in the treatment of SPRAINS and CONTUSIONS, being similar in its action to tincture of arnica, though it is less active than that preparation. It is possible that if alcohol had been employed, results equally good might have been obtained.

Diseases of the Nose.—Marigold is used by T. F. Rumboldt (*St. Louis Med. Archives*, 1873) as an ingredient of a wash; in the strength of one ounce of the tincture to eight ounces of water to which has been added one scruple of carbolic acid and one ounce of glycerine in the treatment of ACUTE NASAL PHARYNGEAL CATARRH. The efficacy of this preparation is probably due to the carbolic acid it contains.

A glycerole of marigold is available.

CALX. Lime. Unslaked Lime.

"An alkaline earth, oxide of calcium, with some impurities, obtained by calcining chalk or limestone so as to expel carbonic acid." (Br. Ph.) Lime is "soluble in seven hundred and fifty parts of water at 15° C. (59° F.) and in thirteen hundred parts of boiling water, and insoluble in alcohol." (U. S. P.) Lime-water, made by stirring milk of lime (*i. e.* slaked lime mixed with water) in water, permitting it to settle and pouring off the clear liquid, is a saturated solution of lime, and contains, as above stated, one part in seven hundred and fifty. The ordinary lime-water and oil (Linimentum Calcis, U. S. P.) is made by shaking together equal parts of cotton-seed oil (or linseed oil) and lime-water, thus forming a weak insoluble soap. Lime fresh from the kiln is known in medicine as caustic lime. Equal parts of caustic lime and caustic soda constitutes "*London Paste.*" (See *Sodium.*) Equal parts of caustic lime and caustic potassa constitutes Potassa cum Calce, *q. v.*

Lime is an astringent to open surfaces, especially to the fissures and to the junctions of the skin and the mucous membrane; it is an antacid, of low diffusion power; it is a caustic, and acts by its attraction for water which it takes from the tissues.

General Surgery.—Unslaked lime is a powerful caustic. It is rarely used by itself. Lime and caustic potash form what is known as Vienna paste, *q. v.*

Diseases of the Skin.—Caustic lime enters into the composition of Vlemingckx's solution. (See *Calx Sulphurata.*)

The preparations of Calx are: Liquor Calcis; Syrupus Calcis; Potassa cum Calce.

LIQUOR CALCIS. Solution of Lime. Lime Water.

"An aqueous solution containing about fifteen hundredths per cent. of hydrate of calcium." It should be kept in well stopped bottles. It is used in the preparation of *linimentum calcis*, which is made by shaking together equal parts of lime-water and cotton-seed oil. A similar liniment is made from lime-water and linseed oil.

The action of lime-water is astringent, alkaline, and antiseptic; at the same time, either by itself or in conjunction with other substances, it makes a bland and pleasant dressing for granulating surfaces.

General Surgery.—In the treatment of BURNS lime-water holds high rank. It forms the chief ingredient of Carron oil, which consists of equal parts of lime-water and linseed or olive oil. Carron oil was first used in the Carron Iron Works in Scotland, and has long had a great reputation in the treatment of BURNS and SCALDS. When the oil is mixed with lime-water it forms a creamy substance which is spread on old linen or muslin, and covered with oiled silk or waxed paper. It is customary to speak of this as a filthy dressing; but we cannot see that it is any less cleanly than other applications, while it is certainly a bland and soothing application to this class of injuries. It is in general use in the hospitals of Philadelphia. When the sloughs have separated and the surface is covered with granulations (which are delicate and have a tendency to bleed), applications of lint soaked in lime-water will be found a satisfactory means of treatment. We have noticed in these conditions that on changing the dressing from zinc ointment to boric acid ointment, and then to lime-water, the granulations appear to keep more healthy, and the cicatrizing process to advance more rapidly than when one line of dressing is alone pursued. Lime-water, owing to its alkalinity and astringency, is often used as a wash in LEUCORRHŒA, VAGINITIS, and GLEET. When the discharge is abundant lime-water is of service in the acute stage; but in chronic conditions it is inferior to bichloride of mercury (1 to 8000), and to tannic acid. Lime-water is used with advantage as an injection to destroy SEAT-WORMS. When employed for this purpose it is important to distend the lower bowel as much as possible with the fluid, so as to unfold the mucous membrane and to bring the agent in contact with all the surfaces, thereby thoroughly cleansing them as well as exposing every parasite to the action of the remedy.

Black-wash (lotio nigra), a non-official but efficient dressing of VENEREAL SORES, is made by shaking up a drachm of calomel with a pint of lime-water. Lint saturated with this mixture may be wrapped about the glans penis. This dressing is especially applicable where much inflammatory action exists. CHANCROIDAL BUBOES that have suppurated are often packed with lint that has been previously saturated with black-wash.

Yellow-wash (lotio flava, aqua phagedænica) is made by adding half a drachm of corrosive sublimate to a pint of lime-water. This combination is less often used than is black-wash. It is more stimulating, and may be employed in the treatment of CHANCROIDS that have a [illegible]nic tendency. The efficiency of both preparations depend on [illegible]ck, and the yellow oxide of mercury, which result from the action [illegible]ime-water on the salts with which they are made.

[illegible]ses of the Skin.—Lime-water enters into the composition of a [illegible] of local preparations employed in the treatment of skin diseases. [illegible] these, black-wash, is one of the best local applications in acute inflammatory diseases of the skin. In all forms of ACUTE ECZEMA it gives the greatest relief. It shares its pre-eminence as a sedative only with dilute lead water, and the solutions or emulsions of the fluid extract of grindelia robusta. In employing black-wash the bottle containing it should be well shaken, and rags wetted with the lotion should be dabbed for some minutes on the affected parts or else laid on and allowed to evaporate. After a time oxide of zinc ointment may be applied as suggested by White, of Boston, but in some cases no ointment can be endured by the skin, and the wash should be used alone as an evaporating lotion.

Yellow-wash, is employed as a dressing in FOUL and especially in SYPHILITIC ULCERS. It is a strong stimulant and detergent.

Lime-water enters into the composition of a number of lotions *e. g.*, Startin's lotion given under " Creta " when it is usually added to preserve a neutral or alkaline condition of the mixture.

Diseases of the Throat.—Lime-water can be used in full strength or diluted. It aids in loosening viscid secretions. Glycyrrhiza is a popular adjuvant in correcting its unpleasant alkaline taste. (See *Calcii hydras.*)

Lime-water forms a permanent mixture with glycerine and carbolic acid. In this form it is useful in the treatment of CROUP.

CALX CHLORATA. Chlorinated Lime.

" A compound resulting from the action of chlorine upon hydrate of calcium, and containing at least twenty-five per cent. of available chlorine." (U. S. P.) It is quite soluble in water when fresh, but if exposed, and the chlorine allowed to escape, it becomes less soluble. Chlorinated lime attacks metals. Its activity may be increased by sprinkling on it, or adding to its solution, a proportion of one of the stronger acids, preferably sulphuric acid.

Chlorinated lime is. a disinfectant and germicide. Its powers of destroying foul odors renders it useful in sick rooms, hospital wards, etc. It is also employed in disinfecting cesspools, water closets, etc.

We believe that the terms "chloride of calcium" and "chloride of lime," when used by medical writers, are equivalent to chlorinated lime.

General Surgery.—The solution of chlorinated lime as a wash (half a drachm to the pint) was formerly used to correct FETID DISCHARGES from the uterus, vagina, and rectum. Its place has been largely taken by corrosive sublimate. The latter, however, while a better germicide, is not so active a deodorizer. The solution should never be of such strength as to cause pain.

Diseases of the Ear, Throat, etc.—Solutions of chlorinated lime in the strength of two grains of the salt to an ounce of water are useful in destroying colonies of ASPERGILLUS in the external meatus. Largely diluted it may be used as an inhalant in putrid conditions of the respiratory passages. A solution of chlorinated lime removes FETOR OF THE BREATH. It is of special advantage in this connection in DIPHTHERIA. J. Solis-Cohen recommends that five grains of chloride of calcium be added to an ounce of the decoction of krameria; two or three drachms diluted with equal quantity of water may be injected night and morning for FETID NASAL CATARRH. W. Horner introduced the practice of using a solution of a teaspoonful of chloride of lime to a wineglass of water as an injection in FETID OZÆNA.

SYRUPUS CALCIS. Saccharate of Lime. Calx Saccharata. Saccharated Lime.

Saccharate of lime is made by dissolving sixteen parts of sugar in forty parts of distilled water, adding five parts of caustic lime, digesting three days with occasional stirring, filtering and evaporating. (U. S. D.)

A *Syrup of Lime* (*syrupus calcis*) is official (U. S. P.) containing five parts of lime in one hundred parts of the syrup. This syrup contains from twenty to forty times as much lime in solution as does lime-water.

Diseases of the Skin.—Latour (*Bull. Soc. de Thérap.*, 2 s. VII, 1880) has recommended a saccharated glycerole of lime as being very soothing to inflamed surfaces. It has been used in BURNS and also in ERYSIPELAS of the face. It is composed of fifty drachms of caustic lime, one hundred drachms of powdered sugar, four pints of water, and one hundred drachms of glycerine. The sugar and lime are intimately mixed in a mortar, the water being gradually added meanwhile, and the mixture repeatedly shaken in a flask for twenty-four hours. It is then filtered, the filtrate is mixed with the glycerine, and the whole evaporated to two pints. This is diluted for use, and is employed in a mixture with almond oil. It will dissolve gelatine.

Diseases of the Throat.—Saccharate of lime is recommended by Gomez de la Mata (*Gazeta de Optalmologia, Otologia y Laryngologia*, July, 1886), as an insufflation in DIPHTHERIA.

CALX SULPHURATA. Sulphurated Lime. Sulphide of Calcium.

"A mixture (commonly mis-named Sulphide of Calcium), consisting chiefly of sulphide of calcium, and sulphate of calcium in varying proportions, but containing not less than thirty-six per cent. of absolute sulphide of calcium." (U. S. P.) "It is a grayish-white or yellowish-white powder, gradually altered by exposure to air, exhaling a faint odor of hydrosulphuric acid, having an offensive, alkaline taste, and an alkaline reaction; very slightly soluble in water, and insoluble in alcohol." (U. S. P.)

Diseases of the Skin.—Sulphurated lime is one of the active ingredients in the well-known *Vlemingckx's solution:* ℞. Calcis vivæ, lb. ¼; sulphuris, lb.ss. Boil with five pints of water and evaporate to three pints. This lotion is much used in vegetable parasitic diseases, as TINEA VERSICOLOR, and in animal parasitic diseases, as SCABIES. It is also occasionally employed in the local treatment of PSORIASIS. It is too strong to use at first in most cases and should be diluted with three to six parts of water. It has a disagreeable odor, resembling rotten eggs, but is often very rapid and effectual.

CAMPHORA. Camphor.

"A stearopten derived from *Cinnamomum camphora*, and purified by sublimation." Camphor is "readily soluble in alcohol, ether, chloroform, disulphide of carbon, benzin, the fixed and volatile oils, and sparingly soluble in water." (U. S. P.) It is readily pulverized by moistening with a few drops of alcohol or ether and triturating. Camphor is a constituent of a number of liniments: *Camphor Liniment*, *Belladonna Liniment*, *Soap Liniment*, *Compound Mustard Liniment*, and also of the *Spirit of Camphor*, in which it is present in the proportion of ten per cent.

The addition of camphor to alcohol or ether to saturation increases the solubility of iodoform (*q. v.*) in either of these fluids from one and a quarter parts to ten parts. Camphor is dissolved in retinol in proportion 1–20.

Camphor is antiparasitic, anæsthetic to unbroken skin, but irritating in concentrated solutions to delicate structures like mucous membranes. It is soothing if used in weak solution. In concentrated solution it is irritating, and may even cause inflammation and sloughing.

Under the general heading of Camphor will be considered Camphor; Campho-Phenique; Camphorated Menthol; Oleum Camphora; Acidum Camphoricum; Camphorated Chloral; Camphorated Naphthol.

General Surgery.—In general surgery camphor has never been used to any extent as a topical application other than in the form of liniments. For the relief of CHORDEE, a suppository containing five grains of camphor at night, or the same combined with from one-twelfth to one-eighth of a grain of morphine will usually be found a very satisfactory mode of treatment. In STRANGURY following blisters the combination of camphor and belladonna given in a suppository will prove an agreeable means of relief.

A clyster of camphor is an effective remedy for SEAT WORMS. Netter and other French surgeons have spoken highly of the use of powdered camphor applied freely to the sloughing surfaces in the treatment of hospital and senile GANGRENE. It may be freely dusted over the surface of a flaxseed and charcoal poultice. A poultice of flaxseed over which morphine and camphor have been dusted, applied hot to the cheek, will often relieve a NEURALGIC TOOTHACHE. Camphor is a favorite domestic remedy, used either in the form of the spirit of camphor or camphor liniment, the latter containing one part of camphor and four parts of cotton-seed oil. These are to be found in almost every household, and are used for the relief of Bruises, Sprains, etc.

Soap liniment is a mild liniment, popular by itself or combined with more stimulating preparations, and is used largely both by the profession and laity. Soap liniment cleanses the skin from adhesive substances that may be left after removing plasters, etc. Shampooing of a limb in camphorated soap liniment after the removal of a Fracture Dressing adds greatly to the comfort of the patient. After the embrocation is used, the parts should be washed with soap and water, dried with gentle friction, and just before the reapplication of the dressing be sponged with equal parts of alcohol and water, or with bay rum.

Camphorated mercurial ointment (Scott's dressing) is composed as follows: Camphor, ʒj; mercurial ointment, ℥j. Its use is indicated in Synovitis with effusion. The ointment is applied to the affected parts on lint; over this are laid four strips of adhesive plaster and the whole is enveloped with a starch or plaster bandage, thus immobilizing the joint, and allowed to remain in position for a week or more. Camphor is used in combination in many tooth powders, and leaves a fresh, pleasant taste in the mouth. The persistent use of it is said, however, to cause the teeth to become brittle.

A preparation composed as follows: Camphor, five parts; chloral hydrate, two parts, and cocaine hydrochlorate, one part, is recommended as a local application in Neuralgia.

Diseases of the Skin.—Camphor is employed chiefly as an anæsthetic in diseases of the skin accompanied by burning and itching. Powdered camphor forms an ingredient of a very useful dusting powder known as "McCall Anderson's Powder," used in Erythema, Erythematous Eczema (Intertrigo), and Urticaria. This is composed as follows: ℞. Pulv. camphoræ, ʒj–ij; pulv. amyli, pulv. zinci oxidi, āā ℥ss. M. It is important that the camphor should be in an impalpable powder.

Powdered camphor has been used with success in Foul Ulcers, and particularly in Hospital Gangrene. It also enters into the composition of several very useful lotions. (See *Kummerfeld's Lotion*, under *Sulphur.*)

Diseases of the Ear, Throat, and Nose.—The vapor of camphor has been employed by Keene in the treatment of Tinnitus. It is blown into the middle ear by means of the Eustachian catheter. Camphor is an ancient remedy for Acute Coryza. It can be used by inhalation, one drachm in a tumbler of boiling water or an ingredient of a powder, and is of especial value in the first stage of the attack. The sniffing of the vapor from the crude gum is of repute in the treatment of Fetid Coryza, for a long time neglected, but of late years its reputation has been revived.

The dosage of camphor in powder is small. A few drops of the spirit of camphor may be placed on a piece of sugar and administered internally. The effect produced probably combines a local with a general effect. The following inhalant for OZÆNA is much used in France according to Moure (*La Tribune Médicale*, November 7, 1889): Camphor, eight grammes; tincture iodine, ten grammes; iodide of potash, two grammes; tar, twelve grammes; alcohol, 90°, one hundred grammes; water, two hundred and fifty grammes. Camphor is compatible with tannic acid. The following formula is recommended by Lefferts for acute coryza in infants: Camphor, pulverized, two drachms; tannic acid, one-half drachm; sugar of milk, one-half ounce. Camphor is an ingredient of a snuff recommended by H. Dobell ("Winter Cough," London, p. 204, 1st ed., Appendix p. 172) in proportion of one drachm to an equal quantity of tannic acid, white sugar and high dried Welsh snuff. To a nasal tampon, camphor to the extent of twenty grains may be added.

In the treatment of diseases of the pharynx where a mild excitant and antispasmodic are needed camphor is useful. It may be ordered in the form of a gargle, four minims of the spirit to an ounce of water. The mistura camphoræ is recommended by M. Mackenzie, combined with tannic acid and a little alcohol. J. Morris Lewis recommends camphor water as a detergent gargle.

In the treatment of LARYNGITIS camphor is frequently used as an inhalant. It assists nitrate of potassium in overcoming SPASM of the LARYNX, TRACHEA and the BRONCHIAL TUBES. One drachm of the spirit added to three drachms of alcohol in the presence of one ounce of water forms an agreeable combination. The spirit of camphor may be added to other stimulating inhalants. It appears to qualify their action in a peculiar manner. The eyes must be protected in the use of inhalants containing camphor, since its vapor is irritating to the conjunctiva.

Lozenges of camphor ordinarily contain about one-twentieth of a grain of the gum.

"Camphor Wool:" Cotton, one drachm; glycerin, ten minims; æther. rect., one ounce. Mix the glycerin with the tincture, saturate the wool with the liquid and dry.

For oil of camphor, see *Oleum camphoræ.*

Diseases of the Eye.—Camphor water in combination with borax and largely diluted with water, was much employed by the late Dr. Dyer in the treatment of CONJUNCTIVITIS.

OLEUM CAMPHORÆ. Oil of Camphor.

"The volatile oil obtained from *Camphora officinarum.*" (U. S. P., 1870.) A liquid of light brownish-yellow color, having the odor and taste of camphor, and the specific gravity of 0.940. It is soluble in all the solvents of camphor.

Oil of camphor is a by-product in the manufacture of ordinary camphor. It consists of terpene, eugenol, safrol, cineol, camphor and other compounds. The commercial oil frequently contains only the terpenes, the other products having been removed.

Sajous recommends the oil of camphor as an inhalant in PUTRID EXHALATIONS.

ACIDUM CAMPHORICUM. Camphoric Acid.

Camphoric acid is produced by boiling camphor in nitric acid. It is in thin, colorless, scale-like crystals, or in large, limpid, monoclinic crystals. It has an acid taste, is soluble in alcohol and ether. Fats and fixed oils dissolve it very sparingly.

H. A. Hare (*Phila. Medical News*, July, 1891) has recently called attention to this agent. Camphoric acid is devoid of taste, is soluble in 160 parts of cold water, and in 10 parts of boiling water, and does not excite the sense of burning which is characteristic of camphor. Nothing is said of the external use.

Diseases of the Throat, etc.—Camphoric Acid has been recommended by M. Niesel (*Deutsche. Med. Wochenschrift*, vol. XL, 1888, quoted in *Journ. of Laryngology and Rhinology*, 1889) for application to catarrhal conditions of the mucous membrane of the pharynx and larynx.

CAMPHO-PHENIQUE. Phenol-camphor. Carbolized Camphor.

Carbolic acid will take up about three times its weight of the gum, and the result is a thin, clear, oily fluid with a strong odor of camphor and a faint odor of carbolic acid.

Campho-phenique is a powerful local anæsthetic when applied to abraded surfaces, or when a few drops are injected under the skin. It is an antiseptic.

Diseases of the Skin.—Campho-phenique has been used as an antiseptic surgical dressing. Joseph Mathews (*Ky. Med. Soc.*, 1890) extols campho-phenique in the treatment of PRURITUS ANI, applied with equal parts of zinc ointment as often as may be necessary. Itching disappears under its use as if by magic. Occasionally he applies the agent in full strength with no detriment to the skin or mucous membranes. Milliken (*Therapeutic Gazette*, December 16, 1889) recommends campho-phenique, one part, with olive oil, two parts, as an application in ERYSIPELAS, the surface of the skin to be kept anointed with the oil. It is alleged that, mixed with ether in equal proportion and injected into a forming BOIL, the inflammatory process is aborted.

Diseases of the Throat, etc.—Campho-phenique has been used with success in DIPHTHERIA, by painting over the surface of the throat with a swab of cotton saturated with the fluid.

CAMPHORATED MENTHOL.

Diseases of the Ear and Nose.—S. S. Bishop (*Jour. of the Amer. Med. Ass'n*, vol. XVII, Oct. 24, 1891, p. 636) describes, under the title of "Camphorated Menthol," a combination (equal parts) of menthol crystals and gum camphor. A clear, oleaginous liquid is reported as resulting from this mixture. Twenty per cent. of this liquid, combined with eighty per cent. of lanoline, were found to blanch and constrict the nasal mucous membrane. It appears also to have analgesic properties. Indications for its use, therefore, are those of cocaine. Dr. Bishop has found it useful also in ACUTE LARYNGITIS, two inhalations of a five per cent. solution were followed by satisfactory results.

R. Seiss highly recommends the following combination as a soothing spray to the nasal chambers: Camphor, gr. iv; menthol, gr. j; terebene, ♏iv; liq. albolene, ℥iv. M.

J. Alexander Randall writes in approval of injections of camphorated menthol in liquid cosmoline in the Eustachian tube for CATARRHAL DEAFNESS.

CAMPHORATED CHLORAL.

Under this name is known a syrupy liquid which results from triturating together equal parts of camphor and chloral. Its action is soothing. It is sometimes used as a local application to the skin in PRURITUS.

General Surgery.—Painted on the skin by means of a camel's-hair brush, or rubbed on the skin, camphor-chloral usually affords relief in NEURALGIA, especially of the superior maxillary and inferior maxillary divisions of the fifth pair of nerves. It is said to allay SPASMODIC COUGH when painted over the larynx. The mixture of chloral and camphor thus prepared has decided solvent properties for other substances. Morphine will dissolve in it in the proportion of ten grains to the fluid drachm, and may be used to increase its efficiency. Chloroform may be added to it without separating its ingredients, thus forming a modified chlorodyne mixture which may be taken internally.

Camphor-chloral will take up morphine, atropine, and other alkaloids in large quantity. The solution containing the alkaloids can be mixed with chloroform without precipitation. This constitutes a topical application of great power, which can be utilized in the treatment of PAIN and INFLAMMATION. It may be painted over the affected part or applied by means of a pledget of cotton saturated with the mixture, which should be covered with oiled silk and kept in position as long as it can be borne. The formula used by R. Bartholow is as follows: ℞. Camphoræ, chloralis, āā ℥ss. Mix and add morphinæ, ℈j; atropinæ sulph., gr. v. When dissolved, add slowly chloroformi, ʒss. Oleum camphoræ, or camphor and lard rubbed together (ʒj–℥j), is an excellent application to PAINFUL and SWOLLEN BREASTS during lactation.

CAMPHORATED NAPHTHOL.

Camphorated naphthol consists of camphor, 1 part; naphthol, 2 parts, triturated together, dry. It is freely dissolved in retinol. M. Blanchard speaks highly of its antiseptic properties, and advises its use as a topical application for slight wounds, etc., as being non-toxic in its action. It is also used as an antipruritic in skin diseases.

CAMPHORATED SALOL.

Camphorated salol is a mixture of two parts of powdered camphor and three parts of salol. A gentle heat is applied until all the ingredients are melted. Camphorated salol is a colorless liquid, insoluble in water, but very soluble in ether, chloroform, and in oils. It rapidly decomposes when exposed to the air and light.

Diseases of the Ear.—Pegou employs camphorated salol in the treatment of OTORRHŒA. It is applied pure on the end of a cotton tampon.

CANNABIS INDICA. Indian Hemp.

Cannabis indica owes its medicinal properties in largest degree to its resin, and in less degree to a volatile oil.

The local action of Indian hemp is that of a sedative. Indian hemp is included by W. H. Beverly (*Brit. Med. Jour.*, September 6, 1884) as an ingredient of a powder for insufflation in HAY FEVER.

CANTHARIS. Cantharides. Spanish Fly.

The Spanish Fly is a beetle "about one inch (25 mm.) long and a quarter of an inch (6 mm.) broad, with ample, membranous, transparent, brownish wings; elsewhere of a shining coppery-green color; the powder is grayish-brown, and contains green shining particles." (U. S. P.) The vesicating principle has been isolated, and is called cantharidin. The official preparations of cantharides are the *Cerate* (thirty-five parts of cantharides in powder in one hundred parts of the finished product, the other ingredients being yellow wax, resin, and lard); the *Ceratum Extracti Cantharidis* (in the preparation of which there is first made an extract of cantharides, and this extract added to a mixture of yellow wax, resin, and lard, so that each one hundred parts contains the extract from thirty parts of cantharides); *Charta Cantharidis* (which is paper coated with a cantharidal plaster of the strength of one part of cantharides to sixteen of plaster); *Collodium Cum Cantharide*, prepared by making a strong chloroform tincture of cantharides and adding it to flexible collodion, so that one hundred parts of the finished product shall contain the blistering principle of sixty parts of cantharides; *Linimentum Cantharidis* (made by digesting fifteen parts of cantharis in oil of turpentine sufficient to make one hundred parts, and straining); and *Tinctura of Cantharidis* (containing five parts of cantharides in one hundred parts of alcohol).

Cantharis is counter-irritant, and may be vesicant, and rubefacient, according to the method of use.

General Surgery.—Cantharis is exceedingly irritating when applied to the skin, causing first redness with burning, then free vesication and pain, and, if kept in longer contact with it, deep inflammation and sloughing. Cantharis in some of its various preparations is the most reliable means of producing vesication. The effect varies with different persons, depending upon the condition of the skin and the part to which the blister is applied. The primary action of a blister is that of a stimulant to the body generally and to the individual organs in the neighborhood of which it is applied, but if allowed to remain long enough to produce much vesication it depresses the bodily powers in proportion to the amount of serum withdrawn from the vessels.

Precautions are necessary in ordering blisters: in pregnancy; in persons of scorbutic, purpuric, or other hemorrhagic disposition; in general debility; in very young or very old persons.

They should never be applied over an acutely-inflamed joint, to the chest in the first stage of pneumonia, over some specialized skin-surfaces, as the scrotum or the skin of the mamma, over bony prominences or where the healing processes are apt to be retarded.

A blister should never be permitted to remain for more than twelve or twenty-four hours. As a rule, it is removed at the end of six or eight hours, even if vesication is not marked, and a soft flaxseed poultice applied. With good material the selected surface will be found covered with large blebs. These should be carefully pricked at their most dependent part and the serum allowed to drain away, thus permitting the raised cuticle to settle back to its old place on the true skin. The part should then be dressed with a layer of dry cotton, kept in place with a few strips of adhesive plaster. If treated in this manner, the healing of a blister is almost painless. The use of flying blisters, after the method of Brodie, is preferable to keeping a single blistered surface raw with irritants. In some persons STRANGURY may arise from very slight contact with any form of cantharides. To obviate this condition, a blister should always be removed as soon as decided pain is felt, and the part dressed with a soft, moist dressing as above stated. A thin piece of paper or muslin may be applied between the blister and the skin. When using a blister, the patient should drink freely of demulcents, and the action of the kidneys be encouraged. In very sensitive persons, where a blister is indicated, it may be produced without pain by painting with cantharidal collodion. Previous to the application of the poultice the part may be sprinkled over with a little morphine rubbed up with starch.

In PNEUMONIA and PLEURISY blisters are frequently employed with great advantage, although authorities are at variance, as to the stage of the disease in which they are useful. Some writers assert that blisters during the febrile stage increase fever. In our experience such is not the case. Care must be exercised in the applications,—not permitting them to be too large, or to remain on long enough to give the patient much inconvenience or pain. There can be no doubt that a carefully applied blister will often relieve pain and quiet cough in either of the above named affections; patients will frequently fall into a quiet sleep.

Large "flying" blisters over the chest favor the absorption of fluid in HYDROTHORAX; they seem to stimulate the absorbents to action, aid in the removal of effused fluid and lessen the risk of the disease becoming chronic. Light flying blisters will usually relieve the troublesome intercostal pains which accompany CHRONIC PLEURISY.

In PERICARDITIS the application of a blister over the region of the heart is often followed by relief of pain and dyspnœa. In certain forms of PHTHISIS, especially the chronic form, in which fibroid degeneration of the lung is to be dealt with, when the cough is paroxysmal, violent, and distressing, counter-irritation over the seat of the disease will frequently markedly relieve the symptoms. As a rule, for this class of cases, painting the skin over the apex of the lung with iodine is a much better means of producing counter-irritation than the application of blisters. In weak persons the withdrawal of large quantities of serum is not free from danger.

In NEURALGIA a blister over the course of the affected nerve is of service, especially in some forms of SCIATICA. Cantharis is superior to mustard, croton oil, iodine, etc., as a means of producing counter-irritation in this condition. Some forms of FACIAL NEURALGIA may be relieved by a small blister applied behind the ear, near the point at which the nerve makes its exit from the stylo-mastoid foramen. A few flying blisters, each as large as a silver dollar, will often relieve the obscure neuralgic pain in the region of the ovaries, which is so common in nervous, hysterical women.

DISEASES OF THE BRAIN AND SPINAL CORD of an inflammatory character (*e. g.*, meningitis), when in the subacute or chronic stage, are often benefited by the application of blisters to the nape of the neck, or along the course of the cord, a little to one side of the spinous processes of the vertebræ. In carefully selected cases of serous apoplexy a blister may be of service, but in the hemorrhagic variety it is of little or no value. In all cases their effect should be carefully watched. If the effect of vesication is desired in the region of the head or neck of a restless patient it is best produced by means of the cantharidal collodion, two or three coats being painted on, the desired size, with a camel's-hair brush. A blister applied to the epigastrium is occasionally useful in allaying PAIN and OBSTINATE VOMITING due to disease of the stomach. In SYNOVITIS, the application of blisters is often restored to. The blisters should never be large, and should not be permitted to remain on long enough to produce ulceration. More advantage can be derived from small, frequently applied, light blisters, than from larger or more profound ones.

These remarks are especially applicable to the treatment of CHRONIC SYNOVITIS of the knee-joint with effusion. The treatment pursued is as follows: About four blisters, the size of a silver dollar, are applied by means of cerate or collodion above and below the patella. The limb is then placed on a splint and firmly retained by a bandage, decided pressure being made on the region of effusion. After the completion of vesication, the joint is enveloped with an ointment of equal parts of mercurial ointment and belladonna ointment spread on lint, and protected with oiled silk or waxed paper, and then firmly reapplied to the splint. The dressing is changed every other day, the skin being thoroughly cleansed with soap, water, and alcohol. About the fourth day the blisters are reapplied, a fresh site being selected. Firm pressure is always kept up, as it hastens the absorption of fluid. As soon as the effusion and pain have disappeared, a firm plaster-of-Paris bandage is applied and retained from four to six weeks, the patient being permitted to walk about.

Blisters are of established reputation in the treatment of RHEUMATISM; a number of flying blisters, if applied in proximity to a painful and tneder joint, quickly remove the pain. It was formerly much more the custom to blister freely in attacks of ACUTE RHEUMATISM than it is at the present day. The advocates of free vesication assert that it modifies and shortens the attack, and lessens the danger to heart complications. CHRONIC MUSCULAR RHEUMATISM, affecting certain muscles or groups of muscles, may be benefited by the application of small flying blisters in the course of the nerve supplying the part.

PERIOSTITIS of the larger bones, *e. g.*, the tibia, may be benefited by counter-irritation with cantharis. After the removal of the blister the part should be dressed with an ointment made of equal parts of belladonna ointment and mercurial ointment. Too much dependence must not be placed on this method of treatment; if, after a fair trial, the pain and swelling are not relieved a free incision through the periosteum may be necessary.

In PERITONITIS and some forms of ENTERITIS blisters may be applied with advantage, not, however, in the acute stages of the disease, when the application of leeches are of greater service. Where peritonitis is general a blister 3 x 5 in., or larger, may be applied over the seat of intense pain, and covered with a light, hot flaxseed poultice enveloping the entire abdomen. Care should be exercised that the pain of the disease does not mask what ordinarily might arise from a blister; for it might be allowed to remain on too long if reliance is placed upon the patient's sensations. After its removal the site of the blister may be dressed with mercurial ointment spread on lint, after which the abdomen may be covered with a poultice. By this means a bland dressing is applied, and the beneficial effects of the mercury are also obtained.

In CHRONIC OVARITIS a small blister in that region is sometimes very effectual when other measures have failed. In GLEET the application of a blister to the penis is strongly advised by Mr. Milton. Care must be exercised that none of the blistering substance, either collodion or cerate, shall escape and inflame the scrotum. It must also be borne in mind that the delicate skin of the penis is easily vesicated. A blister applied to the perineum, along the course of the urethra, is often of service in PROSTATITIS and catarrhal conditions of the prostatic ducts, frequently spoken of as PROSTATORRHŒA.

The habit of MASTURBATION IN CHILDREN, if early detected, may often be counteracted by keeping the penis sore by frequent applications of cantharidal collodion. This should always be done under the care of a physician.

In PHLEBITIS of the superficial veins, especially of some of the large venous trunks, such as the long saphenous, a blister applied over the course of the inflamed vessel reduces the inflammation, hastens absorption or liquefaction of the coagulated blood, and assists materially in the restoration of the circulation through the obstructed vessels.

In POISONED or DISSECTING WOUNDS of the hand, where the *materies morbi* has a tendency to travel along the course of the lymphatic vessels, invading each chain of glands in turn, and where its course is marked by a dark line on the flexor surface of the forearm, a blister completely encircling the arm is sometimes of service if applied early in the disease. Treatment appropriate to the local condition must be vigorously pursued.

Diseases of the Skin.—Cantharis is used in the form of the ordinary blister, and also in the form of the acetum cantharidis, the tinctura cantharidis, and collodium cum cantharide.

In ALOPECIA AREATA blisters are used on the bald patches by the employment of one or another of the above preparations; they are repeated from time to time until the new hair begins to grow. In NÆVI of small size repeated blistering often causes inflammation, with subsequent closure of the dilated blood-vessels. Old and horny patches of chronic ECZEMA are likewise induced to take on more acute action by the use of blisters, after which they may be cured by soothing ointments.

Circumscribed patches of TINEA TONSURANS and of TINEA CIRCINATA may be removed by blistering.

As a rubefacient the tincture of cantharides, diluted with several parts of alcohol, etc., is employed in all forms of ALOPECIA and in PITYRIASIS of the scalp. The following formula, which may be strengthened by the addition of a larger proportion of the tincture of cantharides, is popular: ℞. Tinct. cantharidis, fʒij; olei ricini, ℈j; alcoholis, ad. f℥j. M. This may be rubbed into the bald patches of ALOPECIA AREATA once or twice daily.

In Alopecia Prematura and in Pityriasis Capitis, a vigorous shampooing (see *Spiritus Saponis Kalinus*) should precede the employment of the cantharidal mixture, which may then be applied to various parts of the scalp, by means of a dropper, and thoroughly brushed in.

Diseases of the Ear and Throat.—It was formerly the practice to blister the mastoid region in Otitis Media. While more precise methods applicable directly to the affected parts are now in vogue, it is well to remember the advantage to be derived from the use of a blister in the region named, under some conditions. Blisters are rarely used in the treatment of laryngeal affections. W. K. Simpson has found advantage follow the application of a blister over the larynx in a case of Acute Laryngitis of gonorrhœal origin, accompanied with dyspnœa. In this case salicylic acid had failed to do good. Some practitioners find advantage in placing the blister as far down the neck as the episternal notch.

Diseases of the Eye.—Blisters are not now nearly so much used as formerly in ophthalmic therapeutics. They are sometimes very useful in obstinate cases of Chronic Inflammation, with Marked Irritability of the Eye and persistent pain. They are applied to the temple or mastoid, and when continued counter-irritation is desired may be alternated in these two localities. The most convenient form of application is by means of cantharidal collodion painted on with a brush. When the bleb is ruptured, a piece of surgeon's lint, cut of proper form and spread thickly on the smooth side with simple cerate, cosmoline, or lanoline, makes a neat dressing, which will adhere without support if smoothly applied.

CAPSICUM. Capsicum.

"The fruit of *Capsicum fastigiatum*." (U. S. P.)

The official preparations of capsicum are the *Fluid Extract* (one gramme in one hundred cubic centimetres); the *Oleoresin* (procured by percolating capsicum with ether and evaporating off the ether); the *Tincture* (containing the activity of five parts of capsicum in one hundred parts of the product); and the *Emplastrum* (resin plaster spread on muslin and coated with oleoresin of capsicum).

Capsicum is counter-irritant, rubefacient, and excitant. It possesses, in addition, peculiar properties which clinically associate it with some astringents, such as tannic acid and nitrate of silver. Its use is especially indicated in acute inflammations of superficial parts, either of skin or mucous membrane.

General Surgery.—The oleoresin of capsicum, when applied to the skin, produces in a few minutes intense pain and redness, and finally destroys the cuticle. As a counter-irritant it is inferior to cantharides; as a local remedy its field of usefulness is usually confined to domestic medicine. Dr. Buck states that an efficient way of applying capsicum is to infuse a handful of the crushed pods in half a pint of hot water for from twenty-four to thirty-six hours; then strain and bottle for use. He applies a piece of lint soaked in this liquid to the affected part, and covers it with gutta-percha or oiled silk. It never vesicates, and even a stronger preparation than the one named may be used. The effect is often striking—an attack of acute TORTICOLLIS is relieved in ten minutes. Capsicum is also of service in recent LUMBAGO, NEURALGIA, "RHEUMATIC PAINS," etc. Powdered capsicum, thickly sprinkled on a moist handkerchief or on a piece of moist brown paper, and applied to the skin, is an efficient counter-irritant.

The capsicum plaster of the Pharmacopœia is an agreeable application to some of the mild RHEUMATIC PAINS often felt on the anterior portion of the chest after driving.

McDonald speaks highly of an ointment composed of two drachms of capsicum and an ounce of lard in subacute and chronic RHEUMATISM, when rubbed into the affected part with a gloved hand night and morning. The first thorough application often gives relief. Lumbermen and teamsters wear powdered capsicum in their stockings as a preventive of cold feet.

Diseases of the Skin.—The tincture of capsicum is employed as a rubefacient in the various forms of ALOPECIA, being used in a diluted condition, as the tincture of cantharides is employed. It has the advantage of not producing vesication. Applied pure or somewhat diluted to the skin, it relieves CHILBLAINS (ERYTHEMA CALORICUM).

Diseases of the Throat.—Capsicum is used in the form of the diluted tincture in RELAXED UVULA, either as a pigment or a gargle, in the proportion of a half ounce of the tincture to eight ounces of rosewater, though double this strength has been used. It is also of slight repute in PHARYNGITIS SICCA. The so-called "hot drops," No. 6 of the Thomsonian practice, is a composition of capsicum, myrrh, and golden seal. It is indicated in relaxed state of the mucous membrane of the pharynx in subacute inflammation. In the ANGINA of scarlet fever this gargle has been for many years in repute in domestic practice in the United States. A stronger preparation may be prepared by adding two tablespoonfuls of the powder to a pint of boiling water and vinegar equal parts, to which a teaspoonful of sodium chloride has been added. A powder of fifteen grains of capsicum and ten grains of carbonate of ammonia has been employed by M. Granville as a snuff in the treatment of HAY FEVER. We do not recommend this. Capsicum is contraindicated in deep-seated, acute, phlegmonous inflammation. Capsicum lozenges contain one-half minim of the tincture.

A few drops on a dossil of cotton, inserted in the hollow of the tooth, is an excellent remedy for TOOTHACHE.

CARBO LIGNI. Charcoal.

"Charcoal prepared from soft wood." (U. S. P.) The shoots of the poplar tree or the shoots of the willow tree are the usual source of medicinal charcoal. The first is much used in France and the last in this country. Charcoal contains carbon in proportion varying from sixty-five to eighty per cent. Charcoal is a black, tasteless, porous, brittle, insoluble, and infusible substance, possessing a remarkable power of absorbing gases.

Charcoal is absorbent, disinfectant, and probably deodorant and hæmostatic. Its action is imperfectly understood. It is often used as a diluent of caustics and as a convenient means of conveying dry heat. Japanese hand warmers consist of small, flat metallic boxes, in which a mild form of heat is maintained for several hours by the slow combustion of Japanese carbon. They may be utilized when the prolonged use of dry heat is indicated.

General Surgery.—Charcoal employed for topical purposes is always in a powdered form, and to obtain the best results from its use it is important that it should be powdered immediately after removal from the kiln. If this has not been done it may be reheated to expel the gases condensed in its pores, which would tend to impair its absorbing properties. Charcoal is largely employed in surgery in making the well-known "charcoal poultice." One part of charcoal is incorporated with three parts of flaxseed meal, which is made up like an ordinary poultice. Another method is to dust powdered charcoal thoroughly over the surface of a flaxseed poultice. Though this is frequently done, the method is greatly inferior to incorporating the flaxseed meal and charcoal together.

A charcoal poultice is a serviceable dressing for GANGRENOUS and SLOUGHING SORES, correcting the fetor and arresting the process of ulceration. It has been asserted that when charcoal is moistened, as in a poultice (its pores being filled with moisture), it loses, to a great extent, its property of absorbing or oxidizing gases, and its power as a deodorizer is impaired. In foul, gangrenous sores, where the odor is offensive with ordinary dressings, or even with the charcoal poultice, this may be corrected by placing loosely over the dressing a small flat bag made of cheese cloth and filled with powdered charcoal. Dry charcoal retains its power of absorbing gases for a long time. Exposure to a dull, red heat restores its gas-absorbing properties.

For caustic purposes charcoal is often made into a paste with some of the stronger acids, such as sulphuric, and placed over the part that is to be destroyed. The caustic action can be regulated by the amount of charcoal present. It has been employed where these agents have been used in the treatment of HARD CHANCRE.

Diseases of the Throat, etc.—Charcoal forms the essential feature in the Stenhouse respirator. A layer of coarsely powdered charcoal is held between two sheets of silvered wire gauze. The object is to destroy morbific particles in the atmosphere and to protect the lungs from their presence. Beyond entering into the composition of dentifrices charcoal is little used locally about the mucous membranes of the head. J. W. White asserts that it has hæmostatic properties. Charcoal is of slight service as a deodorant in FOUL BREATH.

Diseases of the Eye.—The Japanese hand warmer is an admirable piece of apparatus for keeping up a high degree of dry heat in threatened SLOUGHING KERATITIS, etc. It is light in weight and can be readily borne when placed on the eye on a thin layer of cotton or a pad of folded lint.

CATECHU.

"An extract prepared from the wood of *Acacia catechu*." (U. S. P.)

It should be noted that the Ph. Br. calls catechu "an extract from *Uncaria gambir*," which is an entirely different product from that recognized by the United States Pharmacopœia. There are many varieties of catechu, all of which have, however, similar medicinal effects. Their activity depends on the presence of catechutannic acid. Catechu is inodorous, and has an astringent and bitter taste. Alkaline salts are said to diminish, if not destroy, its efficacy. *Tincture of Catechu* contains twelve parts of catechu and eight parts of cinnamon, in one hundred parts of the finished tincture.

Catechu is astringent.

General Surgery.—In CHAPPED NIPPLES the tincture of catechu is an efficient application. The nipple being thoroughly cleansed in warm water, the tincture is applied with a camel's-hair brush or a little cotton. In LEUCORRHŒA the infusion of catechu is often used as a vaginal wash, once or twice daily, and has been found useful in lessening the quantity of the discharge.

Diseases of the Throat.—Catechu may be used in the respiratory-mucous surface wherever the use of an astringent is indicated. In solution it does not form so clear a preparation as does Kino or Krameria. It more frequently enters into the composition of lozenges. Each lozenge contains from one to two grains of pale catechu.

In ptyalism and other forms of inflammation of the gums, a piece of catechu allowed to dissolve slowly in the mouth is often of service.

Catechu Wool: "Cotton-wool," one drachm; glycerin, ten minims; tr. catechu, vel kino, vel rhatany, one ounce. Mix the glycerin with the tinctures, saturate the wool with the liquid, and dry.

CAUTERY.

By the term cautery is meant a method of treatment by which albumen in living tissues is coagulated, or the tissues themselves destroyed by fire.

The actual cautery is used for its counter-irritant, destructive, and hæmostatic action, and forms one of the most powerful means which the surgeon possesses. It may be applied either in a simple or complicated manner, as by the heating of any metallic or non-destructible substance to the required temperature by fire, or by the use of some of the more elaborate chemical or electrical apparatus. The common method of its application is by irons of various shapes heated to a red or white heat in a charcoal furnace. A gas cautery has been introduced, by which a jet of burning gas may be directed to the desired spot. The galvano-cautery, owing to the variety and delicacy of its means of application, offers to the surgeon a means of dealing with many conditions which could not be attempted with the more primitive instrument. The electrical current may be obtained either from the chemical or storage battery. For the general use of the surgeon, Pacquelin has introduced a cautery in which the heat is maintained by throwing the vapor of some hydrocarbon (as benzin) upon spongy platinum which has been previously heated. This ingenious apparatus forms a compact, convenient, and easily regulated means of cauterizing, and has almost superseded the use of the galvanic cautery in general surgery. The temperature at which a cautery should be used depends altogether upon the object in view. If used for its counter-irritant and destructive effect, it is best employed at a high temperature, as from a bright red to a white heat; if for its hæmostatic action, the cautery should not exceed a dull, cherry-red. Otherwise, the blood-vessels will be seared through so rapidly that a very imperfect clot will be formed, and bleeding will re-occur. Care should be exercised in the use of the cautery, never to employ it when the temperature is below a dull red heat, as the tissues will adhere to the iron, and on its withdrawal a portion of the burned part will be removed, causing unnecessary pain.

General Surgery.—In ARTICULAR as well as OSSEOUS DISEASE Mr. Barwell speaks highly of the use of the actual cautery, heated to whiteness, as a *counter-irritant.* The agent is of especial value in that obstinate class of joint diseases which, if not corrected, will soon permanently impair the integrity of the parts. The effect produced by the actual cautery is apparently similar to that produced by blisters and other revulsives, although it is a more powerful method. As a rule, the pain caused by the cautery is momentary, less, indeed, than that following the application of a blister. The contact of the heated wire or rod should be for as brief a time as possible, as the object in view is to create a superficial ulcer which will rapidly heal. (See remarks on flying blister, p. 169.) It must be borne in mind that the cautery is not applicable to the early stages of inflammation, neither is it of any service in the suppurative stage. It is best adapted to the long-standing, deep-seated inflammations. Absolute rest of the part affected should always be enjoined after the use of the cautery.

For its *destructive effect* the actual cautery is often employed by the surgeon when the parts involved are very vascular and the use of a cutting instrument is contra-indicated. In CANCER OF THE UTERUS the entire surface of the growth may be altered and much temporary relief obtained by the careful employment of the Pacquelin cautery. The electro-écraseur in action is similar to the ordinary instrument, the only difference being a series of mechanical devices, by which the loop of the écraseur is maintained at a low degree of temperature, so that the wire slowly burns its way through the part to be removed, if properly used, leaving a dry, seared stump. By this method the uterine neck and other vascular parts may be removed without hemorrhage. A similar method is applicable to CANCER OF THE TONGUE. To obtain the best results, a low degree of heat must be maintained otherwise the vessels will be opened so rapidly that a satisfactory clot will not be formed and hemorrhage will ensue.

As a *hæmostatic* the value of the actual cautery has long been recognized. The ancients employed a large flat stone at a red heat to control bleeding from the stump in amputations. The cautery to-day, as a hæmostatic, has a very extensive range of employment, especially in positions where the application of a ligature is impossible, as in bleeding from the internal maxillary artery in the removal of the upper jaw. The temperature must be relatively low and the contact with the bleeding part be longer than for other purposes, to insure the thorough closing of blood-vessels. In the treatment of HEMORRHOIDS the cautery is extensively employed, especially where Smith's clamp is used and the pile is removed with scissors. The base is thoroughly seared with a hot iron, thereby controlling all bleeding. As a rule, the pain following the procedure is much less than in the use of the ligature so extensively employed in this country. The advocates of these procedures are so strongly arrayed on either side that the prudent surgeon will select for operation the method best suited to the individual case. In PROLAPSE OF THE RECTUM, Van Buren recommends linear cauterization with the cautery, the resulting cicatrices serving to contract the bowel. The employment of nitric acid (*q. v.*) will, as a rule, be found a more satisfactory means of dealing with this troublesome condition.

Diseases of the Skin.—The actual cautery is sometimes employed in the treatment of LUPUS, EPITHELIOMA, and NÆVUS. A convenient instrument is that figured in Piffard's "Materia Medica and Therapeutics of the Skin" (N. Y., 1881, p. 232). It consists in a small, curved rod of steel or iron, about the size of an awl, with a small globe of metal near the point, to retain the heat. This is inserted in a shank, and can be heated as desired, over a spirit lamp.

Some caution is necessary in using this or any cautery in large nævi, as bleeding may follow if the tissues are too rapidly destroyed.

The "Pacquelin thermo-cautery" is employed for the same purpose. The construction of this cautery is based upon the property of platinum and some other metals of becoming immediately incandescent, when raised to a certain degree of heat, in contact with a mixture of air and the vapor of some volatile hydrocarbons, and of maintaining this incandescence so long as the contact of the mixture exists.

The apparatus consists of a couple of rubber bulbs and tubes, such as are used in atomizers, a glass receptacle for benzine, and a long, hollow chamber with a perforated wooden handle, through which the vapor is blown. By an arrangement of interior tubes the mixed vapor of air and gas is carried around and over a metallic point. This varies in size and shape, according to the use for which it is intended. This point is heated in an alcohol flame, and then the gases are blown over it by the peculiar apparatus. By working the bulbs with more or less rapidity, the point is maintained at any degree of heat required. (See "Reference Handbook of the Medical Sciences," art. "Cauterization.")

The Pacquelin cautery can be used for all the purposes for which the actual cautery is employed.

A more convenient instrument for cauterization in diseases of the skin is the electro-cautery.

A battery having some arrangement whereby the intensity of the current can be varied at will is required, and a holder to which platinum knives, spirals, etc., are to be attached as desired. The platinum points should not be heated beyond cherry-red. Scarification can be used by this cautery in LUPUS VULGARIS and in LUPUS ERYTHEMATOSUS with very satisfactory results. Small NÆVI, WARTS, hairy or other MOLES, the tumors of MOLLUSCUM EPITHELIALE, and other growths can be very readily and satisfactorily removed by the electric cautery. The only objection to its use is that patients are apt to be afraid of it, as of the knife. The glow of the cautery and the smell of burning flesh give at times unnecessary alarm to timid persons. For that reason the chemical caustics, where these can be employed, are more satisfactory.

(For further description of the electro-cautery, see Van Harlingen, "Handbook of Skin Diseases," 2d ed., Phila., 1889.)

Diseases of the Ear, Nose, and Throat.—The phenomena which attends the use of cautery on the mucous surfaces are as follows: If the cautery be applied to the epithelium, the fire rapidly whitens the selected spot and dense white fumes escape, which have the characteristic ammoniacal odor of singed hoofs. If applied to the deeper layer of the membrane, or to the submucous tissues, the selected surface has a black color, due to the charring of the tissue; it has a black centre surrounded by an areola of white color, caused by the coagulation of albumin on the tissues between the charred spot and untouched parts. When a pit-like depression is made, the sides may alone be charred. The eschar is the part which, being so disorganized by the heat, sloughs off in a few days, leaving an ulcer which rapidly heals. Should the eschar be confined to the epithelial layer, the parts will heal without cicatrix, but should the burning penetrate the connective tissue, then the white cicatrix is inevitable. The compact tissue, as the derm and mucoperiosteum, is more readily charred than the less compact, such as the polypoid and adenoid tissue, the tonsil, etc.

Foulis obtained good results by heating a piece of wire, mounted upon a wooden handle, in the flame of an alcohol lamp and touching the pharyngeal and tonsillar surfaces, but such a method would be difficult, if not impossible, to apply to any of the more concealed surfaces, such as those of the nasal chamber, middle ear, and larynx. By the aid of a platinum loop heated by a current of electricity we are enabled to use the battery in a more accurate and satisfactory manner. Electrodes of shapes and sizes appropriate to the special surfaces to which the cautery is applied have been devised, so that every kind of surface in the neighborhood of the nose, and the throat, no matter how remote, can be reached. Platinum possesses marked advantages in not rapidly fusing and in quickly cooling after being heated. Thus, when an application is made within the larynx or at a locality far within the nasal chamber, little or no danger is incurred of burning the surfaces which are passed in transit. Apart from these considerations, the degree of heat developed in the platinum loop can be controlled absolutely by the strength of the current. The first effect of forcing a weak current of electricity through a loop is to change its bright, silver-like aspect to a black color. This tarnished appearance of the platinum corresponds to what is known as "black-heat." While free from risks of creating cicatrices, black heat is the weakest and most painful form of cautery and is employed by practitioners only when it is desired to lightly touch the epithelial layer. When the parts can be anæsthetized by cocaine, the objections to the pain of the black heat are, in the opinion of some observers, overcome; nevertheless, it is exceptionally employed. When held against muco-periosteum for a moment only, the electrode evolving black heat has no cautery effect whatever, but simply induces the milder effects of caloric.

J. Solis-Cohen (Transactions of the International Congress, 1881, Vol. III, page 269) claims that the electro-cautery when used thus to secure a superficial effect excites an "alterant" effect by modifying the nutrition of the deep-seated tissues; hence, this writer recommends that the agent be employed in a variety of morbid conditions of the nasal mucous membrane and that of the pharynx, as one would employ rubefacients and counter-irritants on the general skin-surface of the body. Especially is this method indicated in a state of engorgement about the follicles of the pharyngeal mucous glands. S. Hartwell Chapman, of New Haven, believes that he can remove opacities in the tympanic membrane, as well as obtain destructions of growths within the tympanic chamber, by touching them with the heated platinum loop; it can be used safely also as an excitant in some forms of DRY and ATROPHIC NASAL CATARRH.

When it is desired to destroy infiltrated tissues, and the physician can safely remain indifferent whether or not submucous structures are involved (as, for example, in the destruction of hypertrophy of the middle turbinated bones) the wire can be heated to the next degree, which is that in which the loop becomes of a brilliant red color, and is known as "rose-heat," or "cherry-heat." A bright rose-heat becomes a dull rose the moment the wire touches the mucous membrane, so that it is important to bear in mind that the burning strength of the wire is discounted the moment the loop touches the selected surface. Most observers prefer the "cherry-heat" or "rose-heat," and are content to produce a white linear eschar. W. E. Casselberry (*Journal of American Medical Association*, February 8, 1890), after defining such eschar, draws the instrument a second and a third time in the same direction as the first, but always at subsequent sittings; he, in this way, determines the position of a cicatrix which is designed to bind down the neighboring parts by attachment to the bony base. By the use of the electrode carried to the "rose-heat" in a similar way, the cautery is admirably adapted to arrest bleeding. It is absolutely necessary in such conditions that the heat be sufficient to coagulate albumin. The agent acts precisely in the same manner as when we use strong solutions of nitrate of silver.

The degree of heat developed in the loop beyond that of "rose-heat" is that of bright yellow, or "white heat." "White heat" is so brilliant that the eye is impressed with the scintillations radiating in all directions from the metal. This step of incandescence is attended with great risk to the instrument, since fusion of the metal will occur if it lasts for more than an instant. White heat is rapidly destructive of all tissues save that of bone, and even this will yield on wafer-like turbinals if a thick and powerful electrode be employed.

The ordinary effect of white heat on living tissue is to produce hemorrhage. It may be employed for the purpose of depletion where patients have refused to permit the use of the knife; playing such a role, MYXOMATOUS MASSES, when too bulky to be conveniently seized by the snare or the forceps, can be incised in various directions and the several clumps disposed for subsequent evulsion. But such adaptation possesses no advantage over the ordinary means of incision, and were it not for the availability of the battery (*i. e.*, being constantly on hand for the imperative demands of special practice) such use would not be thought of.—In some instances where a cautery application to the tonsils is indicated, a rapidly destructive effect can be produced by white heat when the employment of any other form would be followed by distress.

The shape of the platinum loop is made to vary according to the use to which it is put. As a rule, the loop is flattened, when it receives the name of the "knife electrode." The two sides of the loop may be acutely compressed, but the wire remain in the round. This form retains a greater degree of strength than any other, and can be forced into intervening resisting spaces, and even be made to destroy small surfaces of bone. A spiral form may be made out of the loop, which results in a compact moxa-like surface, which can be used on a variety of surfaces, but it is more especially adapted for the destruction of soft, degenerated tonsil-tissue. All things remaining the same, the larger and thicker the loop the greater the difficulty to heat it and the greater power demanded of the battery. It therefore becomes desirable to have the electrode delicate in plan and one which represents the least degree of resistance to the current. All these details, however, belong to the instrument-maker rather than the physician, and have but indirect relation to the subject of local therapeutics.

The galvano-cautery knife can be used to break down membranous obstructions of the posterior nares; such applications, however, in common with all of similar character near the orifice of the Eustachian tube, must be conducted with extreme caution to avoid cellulitis, which is apt to follow, with resultant suppurative inflammation of the middle ear. After the removal of NASAL POLYPUS, the pedicle can be cauterized by the galvano-cautery and the blood-vessels securely closed.

Limitations of the use of the cautery in the nose and throat are now to be considered. The first of these, as already mentioned, is the danger of exciting diffuse cellulitis. This effect of the cautery never occurs in the nasal chamber unless sub-mucous tissues are opened. Hence, speaking within the limits of the judgment which determines all surgical procedures, the cautery can be applied with safety in this region of the body where superficial effects are alone secured and sub-epithelial structures remain intact. To a less precise degree the same is true of the tonsils, but it is difficult to make definite statements respecting these organs, since the class of cases reporting for treatment is one notorious for the frequency in which idiopathic inflammation occurs, and an inaccurate observer is liable to confound coincidence with sequence. Cautery applications are apt to create excitement in the pharynx from inability to keep the throat at rest; hence, traumatisms, even if excited by the cautery applied within the tonsils and pharynx, are more apt to be followed by inflammation than is the case in any other region. Even with these disadvantages the cautery can be safely used on the tonsils with the precaution of covering a small part of the surface with the loop at each visit. The least tractable of any portions of the mucous membrane are the folds of the palate; the slightest burn of either anterior or posterior fold is almost certain to be followed by irritation, if not, indeed, a sharp grade of inflammation.

The second danger is the creation of dry, irritable cicatrices. This can be averted by the use of the black or dull rose-heat.

The third danger is the liability to the occurrence of vaso-motor reflexes. These are rare, but may cause anxiety for twenty-four hours. They have largely disappeared, since the introduction of cocaine.

The fourth and, in reality, the only serious danger is that of encranial involvement. All things remaining the same, the nearer the operator passes in treatment from the plane of the floor of the nasal chamber to that of the roof, the greater become the difficulties of conducting active local treatment. The more abrupt the narrowing of the chamber, the greater becomes the distress should pressure effects develop. The patient also incurs risk by the possible involvement of the veins which convey blood from the nasal chambers to those tributary to the encranial venous sinuses. Reflex phenomena, the result of intra-nasal cauterizations, are almost entirely confined to the surface of the nasal chamber as defined by the ethmoid. As a rule, applications which would be entirely safe to make at the plane of the inferior meatus, or to any part of the inferior turbinal, would not be free from danger at the end of the middle turbinal or to any part above these. For example, a hygroscopic eschar lying on the inferior turbinal would be entirely innocent of causing distress, when a similar mass overlying the middle turbinal might exert so extreme a degree of pressure as to create cephalalgia, or even to excite cellulitis, which, extending to the longitudinal sinus, might have a fatal result. Several cases have been reported of disease of the contents of the brain-case from traumatism developed in the nasal chamber. Although these are excessively rare, the caution cannot be too earnestly enjoined that while surgical measures at the plane of the ethmoid are safe as are operations, let us say, of all grades within the region of the middle ear, yet they should be conducted with the same precaution as in that region of the body, and all applications of the cautery must be carefully watched.

The galvano-cautery has been used with good results in DIPHTHERIA. F. Bloebaum (*Deutsch. Med. Zeit.*, Jan. 1, 1892) places it at the head of local applications. Out of forty cases only one proved fatal.

Diseases of the Eye.—The actual cautery is of great value in the treatment of some conditions of the cornea. Spreading ULCERS and sloughing processes of the cornea are now generally admitted to be of septic origin (Horner, *Klinische Monatsbl. f. Augenheilk.*, Vol. XII, p. 432; Leber, *Centralbl. f. Med. Wissensch.*, 1873, p. 129, etc.), and the natural therapeutic indication is to destroy the infecting material. Nothing else accomplishes this so certainly, promptly, and safely as the judicious application of the actual cautery. It may be made entirely painless by cocaine, or even without it, and the use of cocaine in these conditions of the cornea may sometimes be questionable; no very severe suffering is occasioned. It has been successfully used in SERPENT ULCERS, SLOUGHING KERATITIS, CORNEAL ABSCESSES with or without hypopyon, INFECTED WOUNDS, and obstinate cases of PUSTULAR KERATITIS. Sloughing of the flaps after cataract extraction may sometimes be checked by prompt cauterization. It also affords the best prospect of success in cases of CHRONIC INDOLENT NON-VASCULAR ULCERS and CORNEAL FISTULA. Applied to the apex of the cone in conical cornea, it has been claimed that it produces an ulcer whose cicatrization prevents further bulging. The anterior chamber should not be penetrated.

The galvano-cautery is preferred by some surgeons, but has no great advantage over a properly-shaped instrument of steel or platinum wire, while it is handled with less ease and freedom than the latter and does not admit of the same precision and delicacy of touch. A probe or strabismus hook may be used in an emergency. The thermo-cautery of Pacquelin has also been used, but is not well adapted to the purpose. The use of the actual cautery in the treatment of ULCERS of the cornea was first recommended by Martinache, of San Francisco, in 1873, but did not attain a recognized position in ophthalmic surgery until some years later. Though a number of authors have written strongly in its favor, it is not even yet so generally adopted as it should be. (Knapp, *Trans. Am. Oph. Soc'y*, 1885; Nieden, *Archives of Ophthal.*, Vol. XIII, p. 31.)

CERA FLAVA. Yellow Wax.

"A peculiar concrete substance prepared by *Apis mellifica*. Yellow wax melts at 63° to 64° C. (145.4° to 147.2° F.). It is insoluble in water, soluble in thirty-five parts of ether, and in eleven parts of chloroform, in oil of turpentine, and in fixed and volatile oils, and in boiling alcohol." (U. S. P.) White wax is a constituent of *Ceratum Cetacei*, *Charta Cantharidis*, and *Unguentum Aquæ Rosæ*, and yellow wax of many of the cerates, ointments, and plasters of the Pharmacopœia.

Wax bleached by exposure to "moisture, air, and light," thus avoiding chemical bleaching, constitutes CERA ALBA (White Wax, "Yellow Wax, bleached."

Wax is protectant; by its tenacious character it serves under a limited group of conditions as a hæmostatic.

General Surgery.—Wax is not used by itself to any extent as a local dressing in surgery, although it is often incorporated with ointments in hot weather to give them a proper consistency. It is also frequently, though improperly, added to cocoa-butter in the preparation of suppositories with the effect of making the mass insoluble in proportion to the amount of wax added. Such suppositories are worse than useless, and when inserted in the rectum not only disappoint the physician by the failure of the drug which is incorporated with the suppository to act, but oftentimes induce local irritation. Wax is one of the ingredients in making Lister's carbolized gauze, which is impregnated with crystallized carbolic acid 1 part, common resin and white wax, of each 4 parts. (Cheyne, "Antiseptic Treatment of Wounds," p. 43.) We have used this gauze, but much prefer one from which the wax is omitted, which is a much softer and pleasanter dressing to deal with. It consists of castor-oil, 1 part; carbolic acid, 2 parts; resin, 8 parts, and alcohol, 45 parts. The gauze is saturated with this preparation, allowed to dry, and then packed in air-tight jars. A piece of wax should be in every general operating case, as it is of use in preparing ligatures. At one time all silken or linen ligatures were thoroughly waxed before being applied to vessels, but at the present day the use of the catgut ligature has superseded them almost entirely. All large ligatures for tying PILES or NÆVI, etc., should be thoroughly waxed before using, which makes them much less liable to slip in tying, and renders the knots more secure. A convenient means of arresting HEMORRHAGE from the cut end of bone, especially the end of the tibia after an amputation of the leg, is to drive forcibly a small piece of wax, the size of a split pea, into the cancellated structure of the bone at the bleeding point.

CERII OXALAS. Oxalate of Cerium.

" It is a white, granular powder, permanent in the air, odorless and tasteless, insoluble in water or alcohol, but soluble in hydrochloric acid." (U. S. P.)

Diseases of the Nose, etc.—The oxalate of cerium can be used, according to F. H. Bosworth, in the form of a powder, in the proportion of twenty grains to the ounce of acacia in CHRONIC CATARRH of children.

CETRARIA. Iceland Moss.

" The dried lichen, *Cetraria Islandica*." (Br. Ph.) The plant is without odor and has a slightly bitter taste. Iceland Moss contains a peculiar starch known as *lichenin*, a bitter principle, and other unimportant constituents. *Lichenin* is insoluble in cold water, but readily soluble in hot water. Boiling water dissolves out everything soluble in Iceland Moss, and the solution gelatinizes on cooling.

Iceland Moss is used as an ingredient of a throat lozenge.

CHINOLINE. Quinoline. Leucoline.

" Chinoline is an alkaloid prepared by the destructive distillation of quinine or cinchonine with potassium hydrate, and also, synthetically, by the action of sulphuric acid and glycerin upon nitro-benzol and aniline, or a mixture of these two latter substances. It is a colorless, strongly refractive, oily liquid, having a specific gravity of 1.081 at 10° C." (U.

S. D.). It has an unpleasant odor which is compared to that of the oil of bitter almonds. "Chinoline is sparingly soluble in cold water, more so in hot water; insoluble in alcohol, and mixes in all proportions with ether, bisulphide of carbon, methylic alcohol, etc. It also dissolves camphor and resins. It forms crystallizable salts with acids, the tartrate now being a commercial article." (U. S. D.)

Chinoline is antiseptic. In this respect it is an agent "stronger antiseptic than sodium salicylate, carbolic acid, quinine, boric acid, sulphate of copper, or alcohol. In four-tenths per cent. solution it arrests the putrefaction of blood and the curdling of milk. By a one per cent. solution the coagulability of the blood was completely destroyed." (U. S. D.)

General Surgery.—Domat (*Journ. de Méd.*, Paris, June 10, 1888) regards a 1–150 solution of the tartrate of chinoline as a very useful injection in GONORRHŒA.

Diseases of the Ear, Throat, etc.—Chinoline is recommended in the treatment of OTORRHŒA. C. H. Burnett advises its union with salicylic acid in the proportion of one of chinoline to ten, or of boric acid one to fifteen. Its use has been advocated also in a five per cent. solution in the local treatment of DIPHTHERIA.

Chinoline has been employed in the treatment of GANGRENE of the dental pulp, by introducing small plugs of cotton soaked in a twenty per cent. solution of Merck's tartrate of chinoline. Over this is placed a piece of absorbent cotton sprinkled with powdered chinoline. The dressing is changed every other day, the cavity being washed out with a solution of permanganate of potassium. (*London Med. Times*, June 15, 1885.)

"CHLORAL." Hydrate of Chloral. Chloral Hydrate.

The United States Pharmacopœia incorrectly calls the hydrate of chloral "chloral." So that, under the name of chloral, the hydrate is always supplied in the United States. The name chloral should be applied to an anhydrous product. Hydrate of chloral is found in the market in two forms—the crystals and the plates. The crystalline is to be preferred because of its greater purity, though for external medication, while less active than the crystalline, that of the plates may often suffice.

Hydrate of chloral volatilizes in the air and, consequently, should be kept in well-stopped bottles.

The official chloral is "freely soluble in water, alcohol, ether, and also soluble in four parts of chloroform, in glycerin, benzol, benzin, bisulphide of carbon, fixed or volatile oils. It liquefies when mixed with carbolic acid or with camphor." (U. S. P.)

For the property of union between chloral and camphor see *Camphorated chloral.*

"Chloral" is antiseptic, anæsthetic, and vesicant.

General Surgery.—Owing to the irritant properties of chloral it has been made use of for blistering. It is said to be as efficacious for this purpose as is cantharis, for which it may be substituted in treating persons who object to cantharis on account of the pain it produces. In using chloral for a blister, the drug should be powdered and a layer of it spread on adhesive plaster, taking care to leave a wide margin. The chloral is then warmed over a gas-jet, and as soon as it melts it should be applied to the previously anointed skin. This mode of blistering causes no unpleasant sensations, owing to the anæsthetic properties of chloral. The application should not be permitted to remain on longer than fifteen minutes. Its vesicating properties probably depend on the breaking up of the chloral by the alkalinity of the skin and its secretions into chloroform and formic acid. All things considered, the use of chloral as a vesicant is not to be commended. If left too long in contact with the skin it may cause sloughs, the risk of which is increased by the freedom from pain and consequent absence of warning to the patient.

Marc Sée (*Journ. Amer. Med. Assoc.*, April 25, 1891) has made use of chloral hydrate in the treatment of 200 cases of HYDROCELE. He employs a ten per cent. solution, one ounce of this being thrown slowly into the sac. In two or three days a large effusion occurs, which is soon absorbed.

Crégny (*Gaz. de Gynecol.*, May 1, 1888) has secured good results by the following treatment for ANAL FISSURE: The lower bowel is emptied and a pledget of lint soaked in a twenty per cent. solution of chloral is then lodged in the fissure. This remains until it is expelled by the movement of the bowels, when a second application is made.

Four grains to the ounce forms a solution used by Mitropolsky in CRACKED NIPPLES.

The antiseptic properties of chloral have long been recognized. Consequently it is used as a wash for FOUL ULCERS, BURNS, CANCERS, and also as a vaginal douche in CANCER OF THE UTERUS. In strength of five to ten grains to the fluid ounce it forms an admirable antiseptic and sedative dressing for wounds, being applied on lint soaked in the solution and covered with oiled silk or waxed paper.

Injections of a one per cent. solution of chloral have been used with success in treating GONORRHŒA. In nearly all cases pain and erections are controlled in a few days. It will, however, occasionally fail.

Oré has proposed intravenous injections of chloral as a substitute for ether and chloroform anæsthesia in surgery and as a means of combating TETANUS. This plan has been carried out by himself and others with asserted good results; but from the danger attending the use of chloral in this way, and from the fact that inhalations of ether and chloroform are both safer of application, it has never come into general use.

Chloral exerts great influence on fibrin, and has been used to coagulate the blood in VARUS. But intravenous injection of the drug may produce thrombi, and for this reason its use is to be deprecated.

Diseases of the Skin.—Chloral is antiseptic and sedative in its local action. In URTICARIA the following formula has proved useful as a local application: ℞. Chloral hydrat., ʒiij; aq. laurocerasi, f℥viij. It is employed in the local treatment of BROMIDROSIS and HYPERIDROSIS, a solution of chloral in water, the strength of ten to thirty grains to the ounce, being commonly employed. A concentrated solution of chloral in water has sometimes been employed in stubborn VENEREAL ULCERS.

Spohn has asserted that chloral is the best local application in FURUNCLE. Compresses of cotton moistened with a solution of one drachm of chloral in four drachms each of glycerin and water are kept constantly applied.

Camphorated chloral is made by rubbing up equal parts of chloral and camphor, which melt together, forming a thick liquid. This may be mixed with wax and lard in due proportions to form an ointment of ten to fifteen grains to the ounce. This is useful in PRURITUS where the skin is unbroken. (See p. 165.)

Diseases of the Throat.—Chloral hydrate has been used by Gomez de la Mata (*Revista de Laryngologia, Otologia y Rhinologia,* Barcelona, Oct., 1888) as one of the ingredients of a wash, in combination with carbonate of soda and borate of soda for the nasal chambers in OZÆNA. It has been employed also as an antiseptic in the form of a lotion in the treatment of DIPHTHERIA, in the strength of a one per cent. solution. E. J. Moure uses a weak solution as a douche in PHARYNGITIS SICCA. Chloral removes fetor and aids in softening deposits in DIPHTHERIA. A pigment composed of twenty-five grains of the drug to a drachm of syrup is recommended by M. Mackenzie.

A few grains of chloral placed in the cavity of a carious tooth will usually relieve TOOTHACHE. Several cases are reported where this treatment cured HEMICRANIA. (*Practitioner,* May, 1881.)

CHLORALUM.

Under this name a trade preparation was in vogue a few years ago. It is now little used. Chloralum is a solution of chloride of aluminum. F. P. Atkinson (*Practitioner,* Jan., 1887) uses chloralum, pure or slightly diluted, in the treatment of NASO-PHARYNGEAL CATARRH.

CHLORINE. (See *Calx Chlorata.*)

Diseases of the Throat.—Chlorine is administered in diseases of the respiratory tract either in form of nascent fumes or through the medium of water—the latter phase being known as "chlorine water." Chlorine gas can be evolved at the time of its being used by the addition of dilute hydrochloric acid to chlorinated lime; one-half to two drachms of the lime to be placed in an open vessel and the acid poured upon it. Chlorine gas is recommended in the treatment of PHTHISIS and in CHRONIC BRONCHITIS associated with copious expectoration and emphysema. E. L. Shurly recommends that the patient be placed in a small room, the air of which is saturated with moisture arising from a spray of a saturated solution of sodium chloride; when this has been accomplished the fumes of chlorine are permitted to escape in the apartment. It is claimed that this admixture of the watery vapor of the solution of sodium chloride with chlorine renders the preparation more respirable; ten to thirty minutes suffices for a treatment. The patient is instructed to breathe through the nose, keeping the mouth closed, and to refrain from talking. If coughing occurs the treatment should terminate. One to three inhalations may be given daily.

Chlorine water has had for many years a reputation as a local sedative in the SORE THROAT of SCARLATINA and MALIGNANT PHARYNGITIS. Largely diluted (one drachm to a pint of water) it can be used as an inhalant. It forms an admirable disinfectant to any part of the respiratory passages, and can be used in the nose in FŒTID CORYZA or as a spray to the affected parts as well as a gargle in the treatment of DIPHTHERIA. It is best that the water should be at a temperature of 140°. J. Merces (*Lancet,* October 30, 1886) especially recommends chlorine water for the treatment of DIPHTHERIA; one-half drachm of hydrochloric acid is added to a drachm of chlorate of potash in a six-ounce vial; while the nascent fumes are being generated the vial is filled with water; an ounce of this mixture can be used at one time as a gargle every three hours.

CHLOROFORMUM. Chloroform.

Both Chloroformum venale and Chloroformum purificatum are official (U. S. P.), with the intent that the purified should be produced from the commercial, and the purified alone used for purposes of inhalation. Purified chloroform is described as "a heavy, clear, colorless, diffusive liquid, with a characteristic, pleasant, ethereal odor, a burning, sweet taste, and a neutral reaction. It is soluble in about two hundred parts of water, and in all proportions in alcohol or in ether, also in benzol, benzin, and fixed or volatile oils. Its specific gravity is 1.485 to 1.490 at 15° C. (59° F.). It boils at 60° to 61° C. (140° to 142° F.)." (U. S. P.)

Chloroform in bulk is rubefacient and parasiticide. In the form of vapor it is anæsthetic, sedative, and antispasmodic.

Chloroform was introduced into practice as an anæsthetic by the late James Y. Simpson in 1847, and from that date to the present time it has held a foremost place with English and Continental surgeons. Notwithstanding adverse criticisms, chloroform holds its own against many claimants for favor. In most cases its administration is agreeable to the patient and rapid in action; complete insensibility is obtained with little laryngeal or bronchial irritation, and almost entire absence of nausea; it is economical both in the amount required to be used in each administration as well as in the first cost, while its concentrated character makes it invaluable for field operations. But these advantages are overbalanced by the danger which attends its use, so that its employment under ordinary circumstances is unjustifiable. It causes death without warning, and so suddenly that no forethought or skill can guard against the result. It is fatal alike to the robust and the weak, to the well and the diseased. Previous harmless inhalations are no guaranty against its treacherous action. When death from chloroform-inhalation takes place, it is from one of two causes: First, from a gradual paralysis of the respiratory muscles induced by the action of the drug on their controlling centres; second, from cardiac syncope, the heart at one moment beating well, and at the next moment ceasing to beat forever. This cardiac syncope constitutes the great danger of chloroform, since, when the respiratory centres are affected, we can watch the state of the breathing, and following out certain rules, danger can be averted; but when death takes place from cardiac syncope, there is no warning.

Chloroform narcosis is usually divided into three stages. The first of these is similar to alcoholic intoxication; it usually is very short, but in persons of intemperate habit it may be violent and prolonged, and to entirely overcome this may be fraught with danger. In this stage, although consciousness be not lost, sensation is blunted. It is soon followed by the second stage, which is that of complete anæsthesia. Consciousness and the sensibility are abolished, the muscles are relaxed, and the patient lies quiet. This is the stage in which operations are performed. The third stage is one of profound narcosis, with stertorous breathing, muscular relaxation, and abolition of all reflexes. This condition is accompanied with great danger, and the anæsthetic should never be pushed so far, except under peculiar circumstances.

The pulse in chloroform narcosis is not always a reliable guide. At first it is apparently strengthened or quickened; in the second stage it is about normal in frequency, but weakened; in the third stage it may be rapid and weak.

Chloroform is best administered on an empty stomach, or three or four hours after a light, readily absorbed meal. It is usually well to administer a little brandy in water about twenty minutes before the inhalation. Everything tight about the chest, neck, and abdomen should be loosened or removed; the patient should lie on his back, with the chest well exposed· Artificial teeth should be removed. Serious results have followed neglect of this precaution.

Various appliances are used for administering chloroform. It is sometimes poured over a sponge enclosed in a cone made of a towel or napkin. We think it is best given from a folded handkerchief or a piece of lint, held at first five or six inches from the nose, and then brought as near as an inch, but never allowed to touch. Not more than from a half to one fluidrachm of chloroform should be poured on the napkin at once. To prevent evaporation a towel is often thrown loosely over the operator's hand and the patient's face. This should never be done, as one of the principal dangers in administration is the concentration of the vapor. Hence, the administerer should constantly bear in mind the importance of allowing a sufficient admixture of air, and his attention should never for a moment be withdrawn from his work. The pulse, the respiration, and the color of the face are three important things to be closely watched. The average amount of chloroform required for an ordinary operation is from half an ounce to one ounce, though it is stated that as much as twenty ounces can be administered in two hours without unpleasant consequences. Various inhalers have been devised in order to regulate the amount of chloroform used and to secure the proper admixture of air. The one devised by Clover is probably the best. On the appearance of the first sign of danger, *e. g.*, failing pulse, lividity of the face, irregular gasping respiration, or stertorous breathing, the administration should be stopped, and the patient should be allowed to breathe fresh air. When respiration is arrested, the tongue should be drawn forward with a pair of forceps, or, what is equally good, the inferior maxilla should be drawn or pushed forward, as by so doing the muscles that are attached to the lower jaw, the larynx and hyoid bone, are drawn upon and open the larynx more freely than is done by simply drawing the tongue forward. If these measures fail, any pillows that may be under the patient's head should at once be withdrawn, and artificial respiration should be started and persisted in for at least half an hour. It is considered best by many authorities, in cases of heart failure, to place the body at an angle of forty degrees, with the head downward to favor the passage of arterial blood to the brain. This can readily be done by raising the feet of the bed or table and placing them on two chairs. The alternate dashing of hot and cold water on the chest, neck, and face is often efficacious. Faradization of the diaphragm, by placing one pole at the pit of the stomach and the other over the larynx and the root of the neck, has acted well in some cases. Nitrite of amyl should be used as a means of restoring the heart's action. Ammonia injected into a vein and digitalis given hypodermically may be used to stimulate the heart's action. The administration of alcohol is (as a rule) contra-indicated.

From experiments it has been proved that persons in sound sleep may be chloroformed without being wakened. Anæsthesia cannot be produced on any one partially awake, or sleeping lightly, without his knowledge. Chloroform should never be administered to a woman without the presence of a third party, preferably one of her own sex.

It has been suggested by some authorities that a mixture of chloroform and ether acts with advantage and avoids the evils of both agents. The "A. C. E. mixture," once much used in England, consists of ether (æther) three parts, chloroform two parts, alcohol one part, the alcohol aiding in making a more perfect mixture and causing equal evaporation. From our experience we do not think that more benefit is derived from mixed vapors than is obtained from the use of a single anæsthetic, while serious consequences have followed the use of mixtures, which would not have occurred had the surgeon confined himself either to chloroform or ether.

General Surgery.—In obstetric practice the value of chloroform inhalations has been universally recognized, and we believe that no fatal cases have followed. It is not now used in all stages of labor, or carried to the same extent as it was formerly, for experience has shown that in the early stages it materially interferes with the uterine contractions. While it unquestionably annuls suffering, it frequently tends in a marked degree to diminish the force and frequency of the pains, and consequently to retard labor. In administering chloroform during the propulsive stage of labor, it should be given intermittently, using a few drops on a handkerchief as a pain comes on. During the acme of pain the patient inhales freely, and as the pain dies away the napkin should be removed, so that in the interval between the pains the effect of the drug passes off. Bearing in mind the tendency of chloroform to produce uterine relaxation, more than ordinary precautions should always be taken against post-partum hemorrhage. (Playfair.)

In PUERPERAL CONVULSIONS chloroform-inhalation is frequently useful. Charpentier found that, in nearly seventy-five per cent. of the cases in which he employed it, it had the effect of diminishing or arresting the attacks, only one case proving fatal.

In the treatment of NEURALGIA, R. Bartholow has found chloroform extremely valuable, and it is most effective when used by the method of deep injections as proposed by him. This consists in injecting, in the neighborhood of the affected nerve, from five to fifteen minims of pure chloroform. Rarely does any local mischief result from these injections, except a temporary induration. He has procured apparently permanent relief by this means in long-standing cases of neuralgic pain affecting the superficial divisions of the fifth pair of nerves. Pain in superficial nerves may be relieved by the local application of chloroform. The following prescription is useful: ℞. Chloroformi; tinct. aconit. rad.; āā f℥ss; liniment. saponis, f℥j. M. Ft. linimentum. A piece of flannel moistened with this is applied to the painful part, evaporation being prevented by covering with oiled silk. Chloroform is frequently used as a means of producing counter-irritation in Ovarian Neuralgia, and other obscure pains, by placing from twenty to thirty drops under a watch crystal, and keeping it in contact with the skin for a short time.

We have used a mixture of menthol, ʒj; chloroform, ʒx; ether, ʒxv, as suggested by Dobisch, in a spray, for its local anæsthetic effect in minor surgical operations. The anæsthetic effect is said to last from two to six minutes. It does not possess any advantage over rhigolene spray, and to many persons the odor of menthol is unpleasant. Chloroform liniment is a valuable preparation as a stimulant application in Old Sprains and Contusions.

Curling commends a combination of chloroform and zinc ointment with a wash of sulphuret of potash (ʒj to ℥viij of lime-water) in Pruritus Ani. In Irritable Rectal Ulcer this writer also speaks highly of the following ointment: ℞. Chloroformi, ʒj–ij; zinc. ox., ʒss; ol. olivæ, ʒj; cerat. cetacei. M. Ft. ung.

Diseases of the Skin.—Chloroform is employed as a local anæsthetic chiefly in Urticaria. Used as a lotion with alcohol in the proportion of a drachm to the ounce, it often gives relief.

In Pruritus an ointment of one drachm of chloroform to the ounce of lard is occasionally found useful.

Chloroform is also used as a parasiticide in Pediculosis Pubis. A piece of lint saturated with chloroform is placed over the pubis and covered with oiled silk. All pediculi are at once killed,—the ova are afterward removed with vinegar.

Diseases of Ear, Nose, and Throat.—The vapor of chloroform may be thrown in the ear by Eustachian catheter for Tinnitus. Later observers place little reliance on this therapeutic application. For Otalgia a rubefacient effect is produced by rubbing chloroform liniment over the mastoid region. A few whiffs of the vapor of chloroform will sometimes relieve the distress of the first stage of Acute Coryza. On the whole, chloroform is the most reliable agent which can be employed in the destruction of Maggots in the Nostrils. It can be diluted in about an equal proportion of water and thrown in the nasal chamber. The ulcers of Sore Throat are treated by applications of a lotion composed of one part of chloroform to twenty of water (J. S. Cohen).

SPASM OF THE GLOTTIS is more quickly overcome by inhalations of the vapor of chloroform than by any other means. The patient breathes the vapor as in the induction of general anæsthesia, until the spasm relaxes; as a rule four or five inhalations suffice. When it is desirable to order an inhalant containing chloroform, it is advised that chloroform diluted one-half with alcohol be added to hot water in the proportion of one-half drachm to two drachms to the pint.

The vapor is indicated in IRRITATIVE COUGH which appears to be in excess of the cause. Such "useless cough" is particularly annoying at night. A few drops of chloroform may be poured on the sponge of a Yeo inhaler before retiring, or placed in a half pint of water at 145° F., and inhaled. Chloroform also allays the cough of INCIPIENT PHTHISIS. In SPASMODIC ASTHMA chloroform-inhalations short of anæsthesia are often of value. There is no agent which relieves so large a number of cases. When it does not cure it is of value in affording temporary respite. The more promptly it is given in a paroxysm the better; for, if a spasm has existed for a time, it is apt to recur as soon as the influence of the chloroform has passed off. A few drops at the first indication of an attack may act as a preventive. It should always be administered under medical supervision. A mixture composed of an ounce of tincture of aconite, ten grains of menthol, and one drachm of chloroform, forms a mixture which, when applied freely to the gum tissue about a tooth, permits minor operations to be performed without pain. Leffmann ("American System of Dentistry," III, 699).

CHRYSAROBINUM. U. S.; Br. Chrysarobin. Goa Powder.

"A mixture of proximate principles (commonly misnamed Chrysophanic Acid) extracted from *Goa Powder*, a substance found deposited in the wood of the trunk of *Andira araroba*." (U. S. P.) It is a "pale orange yellow, crystalline powder, permament in the air, odorless and tasteless, almost insoluble in water, only slightly soluble in alcohol, readily soluble in ether and in boiling benzol. In solutions of alkalies it is soluble with a yellowish-red or reddish-yellow color, which is changed to red by passing air through the liquid." (U. S. P.) It stains fabrics indelibly. It is the substance from which *Chrysophanic Acid* is made. *Chrysophanic Acid* occurs in yellow needles or plates. It is soluble in alcohol, ether, or benzol; alkalies also dissolve it. It is one of the substances to which rhubarb owes its yellow color. The official ointment is too strong for use, and should be diluted with four parts of lard. (*Lancet*, October 19, 1889.)

The action of chrysarobin on the skin is that of a "reducing" agent. It has a strong affinity for oxygen, which it abstracts from the tissues, and thus becomes converted into chrysophanic acid.

General Surgery.—Kassabudski has used chrysarobin with success in the treatment of HEMORRHOIDS. His method of treatment is as follows: The parts are first washed with a carbolized or creolin lotion, and then dried with absorbent cotton; after which the following ointment is applied: Chrysarobin, 6 parts; iodoform, 3 parts; ext. of belladonna, 6 parts; vaseline, 15 parts. In the treatment of internal piles, if very sensitive and liable to bleed, a suppository of tannic acid may be used and followed by one composed of chrysarobin, one grain; iodoform, half a grain; extract of belladonna, one-eighth grain; cocoa butter, a sufficient quantity. After pursuing this treatment for a few months the piles will be found shriveled up.

Diseases of the Skin.—Goa powder was introduced some years ago from India as a remedy for RINGWORM. It was soon found to have a beneficial influence upon other affections of the skin, and its virtues being ascertained to be due to the chrysarobin contained in the powder this preparation gradually took the place of the latter.

Occasionally conjunctivitis occurs during the use of chrysarobin, whether from the direct irritative action of the drug or through absorption is not known.

Some persons have a peculiar idiosyncrasy to the drug, and its application gives rise to severe dermatitis with fever and occasionally symptoms of poisoning, shown by vomiting, diarrhœa, and a tendency to œdema of the lungs, indicating an irritative action on the mucous membranes.

Chrysarobin is employed in the treatment of PSORIASIS, the VEGETABLE PARASITES of the skin, particularly TINEA CIRCINATA and TINEA SYCOSIS, and in CHLOASMA.

In psoriasis the scales are cleansed off by the use of soap or a solution of salicylic acid in alcohol (℈j ad f℥j), and then the drug in the form of an ointment of ten to forty grains to the ounce of lard is rubbed thoroughly in. The face and scalp, as also the genitals, are to be avoided in these inunctions, as they are peculiarly liable to inflammation. If the disease is spread over the body the inunctions should not be too extensive at first until the effect on the patient has been ascertained.

Usually, after a three or four days' course of treatment, the inunctions having been made twice daily, the diseased patches are found perfectly smooth and destitute of scales, and of a peculiarly blank white color, while the surrounding skin is sharply defined by an area of a violaceous tint. The parts should then be allowed to rest for a time until it is ascertained whether the disease has been removed. If the treatment is prolonged inflammatory action results.

In addition to the danger of exciting inflammation of the skin, chrysarobin has the disagreeable quality of staining clothing, etc., with which it comes in contact, an indelible yellow or purple color. For this reason it has been superseded by pyrogallic acid, naphthol, and other drugs inferior to it in effect upon the psoriatic patches, but without this drawback.

Besnier has suggested painting the Psoriatic Patches with a solution of chrysarobin in chloroform, fifty grains to the ounce. When this is dry it is covered with the liquor gutta-perchæ (ten per cent. white gutta-percha to ninety per cent. chloroform), which protects the clothing from the action of the chrysarobin. This application, however, is not so efficient as is that of the chrysarobin ointment.

In Chloasma, Lentigo, etc., a solution of twelve per cent. chrysarobin in chloroform may be painted in successive layers upon the affected skin previously cleansed with soap in alcohol. When the layer of chrysarobin has dried upon the skin, it is to be coated with liquor gutta-perchæ. The applications are to be renewed when worn off. Not only chloasma and lentigo, but even Pigmentary Nævi may sometimes be removed by this application. In the latter an ointment of salicylic acid should first be applied to soften and cleanse the warty surface.

Chrysarobin has been recommended in Lupus Erythematosus and in Alopecia Areata. In our experience, however, it has not proved successful in either of these affections. The ointment is the best form to employ chrysarobin in alopecia areata, while the solution or suspension in chloroform or liquor gutta-perchæ is best adapted to use in lupus erythematosus.

Chrysarobin is an admirable application in the vegetable parasitic diseases of the skin. In Tinea Circinata a solution of five to ten grains to the ounce of collodion painted on the patches causes their speedy disappearance, while an ointment of twenty to forty grains to the ounce of lard carefully rubbed into the affected parts in Tinea Sycosis will often produce the happiest effect in a surprisingly short space of time.

CIMICIFUGA. Actæa. Black Snakeroot.

The rhizome and rootlets of *Cimicifuga racemosa*. Its preparations are *Ext. Cimicifugæ Fluidum* and *Tinctura Cimicifugæ*.

According to Ringer, who includes it under Actæa, cimicifuga is useful "in Mild and Malignant Sore Throat, and that troublesome and obstinate disease in which the mucous membrane of the pharynx is quite dry and spotted over with inspissated mucus."

COCAINA.

An alkaloid extracted from *Erythroxylon Coca*. The salt formed by combining the alkaloid with hydrochloric acid is known as the hydrochlorate, or more properly as the hydrochloride. When cocaine is spoken of or prescribed, this salt is usually understood, as the uncombined alkaloid is almost insoluble in water, and is rarely, if ever, found in the shops. Hydrochloride of cocaine occurs in nearly colorless, acicular crystals, and is freely soluble in water and alcohol. It is dissolved in retinol in proportion 1–30. In the presence of iodide compounds, chloride of zinc and chlorate of soda, it becomes milky. When dissolved in alcohol it readily mixes with castor oil and rhigolene. (A. Stabler, *Phila. Med. News*, April 16, 1887.) The other salts of cocaine that have been found useful are, the hydrobromide, borate, phenate (*q. v.*), salicylate, oleate, and nitrate. The last named is useful when it is desired to use the alkaloid in conjunction with silver nitrate. The oleate has been prepared in a crystalline condition, but as found in commerce is liable o be of varying strengths.

Cocaine is analgesic and ischæmic. It is used in the main to induce anæsthesia for purposes of surgical application and exploration, and to secure temporary constriction of the smaller blood-vessels. After the impression last named ceases a stage of dilatation ensues. It is thus hemostatic only in its primary impression, the secondary impression tending to induce bleeding. A cocainized surface is at first paler and more compressed than is the normal, and afterward it becomes reddened and somewhat turgescent. Since dilated states of vessels favor secretion it follows that the secondary impression of cocaine is accompanied by increased outflow when the application has been made to a gland-bearing surface.

The effects above named will be varied by the peculiarities of the anatomical region, habits of patients, etc. Thus pallor is more noticeable in the conjunctiva than elsewhere. The constricting and dilating effects in erectile tissues are especially marked in the nasal chambers, and the secretory effects are often noticeable in the larynx where the untoward result of a full impression is noticeable in the impaired quality of the voice.

An over-impression of cocaine may arise from almost any strength of solution, though it is more apt to occur in concentrated preparation; markedly toxic symptoms have been known to follow upon an injection of a few drops of a four per cent. solution into the urethra, while, on the other hand, cases are reported where large quantities of the drug have been injected without producing any unsought-for effect. H. C. Wood mentions a case where ten grains were taken hypodermically by a man while on a debauch without fatal results. COCAINE INTOXICATION is characterized by vertigo, depression, nausea, difficult articulation, followed by restlessness. Flushes of heat are sometimes complained of. The duration of the impression lasts from five to eight hours. Dellose and Droz (*Rev. Med. de la Suisse Romande*, June, 1889) claims that deaths can be attributed to cocaine poisoning. The writer last named reports five cases. In all operations demanding the use of the knife it is well after an application of cocaine to allow the parts to bleed freely after incision to remove as much as is possible of the drug from the circulation. It has been noted that persons addicted to alcoholic stimulants are peculiarly susceptible to the action of cocaine. Cocaine intoxication appears to be oftener seen after application about the head than elsewhere. For the relief of cocaine intoxication inhalations of the nitrite of amyl, should be resorted to, and the impression of caffeine secured, while the patient's strength is being sustained. Among other measures than the above may be mentioned the exhibition of belladonna, the inhalation of the vapor of ammonia, and external friction.

General Surgery.—The indications for the use of cocaine in relieving pain and relaxing spasm are numerous. On the whole, the specific effects are best exhibited on the mucous membrane of the genito-urinary tract and rectum, and to parts of the body where the circulation can be under the control of the operator, as in the extremities.

Wende (*Jour. de Méd.*, Paris, January 15, 1888) recommends lanolin, containing four per cent. cocaine, as an application for BURNS. He states that it forms a protectant, anodyne dressing that is easily managed. Cocaine being insoluble in fatty substances, it is advisable, where it is to be used in ointments, to first dissolve it in oleic acid and afterward to add to it the other substances in small quantities at a time. Treated in this way, cocaine may be mingled with greasy substances and a homogeneous preparation obtained. All things remaining the same, the impression of cocaine is of use in proportion as the pain is of an irritable and exciting character. It is of special value on mucous surfaces in the regions near skin surfaces, *e. g.*, the vagina, urethra, and rectum, etc. A few indications will be given for its use in the female genito-urinary tract. In estimating the value of cocaine in gynecology, it must be remembered that its field is limited, as there are many women who are too sensitive and too apprehensive to be kept quiet during a protracted operation by anything short of general anæsthesia. According to Polk, cocaine may be of service in operations on the uterine cervix. In this connection may be mentioned incisions, forcible dilatation of the canal, the application of caustics, or the use of the curette. Even in commencing CANCER the free application of the actual cautery can be made if the sensibility of the part has been previously blunted with cocaine injections, three to five minims of a four per cent. solution, into the region that is to be operated upon. In the vagina more care must be exercised, owing to the greater sensitiveness of the tissues. Satisfactory results are obtained in the treatment of small VESICO-VAGINAL FISTULÆ. Four minims of a four per cent. solution are injected on either side of the fistula half an inch away. The mucous membrane of the vagina and bladder is then freely painted with the solution, after which the tissues can be excised without pain.

In the removal of super-sensitive URETHRAL CARUNCLES a four per cent. solution of cocaine may be successfully injected at their lines of attachment. In like manner CHANCROIDS and CHANCRES may be painlessly cauterized after painting the surfaces several times with a four per cent. solution. In VAGINISMUS it is of special service applied in the form of an ointment (five grains to the ounce) to the vagina and vulva a short time before coitus or the introduction of a speculum. Nagura has used cocaine with satisfactory results in obstetric practice. According to this writer, the drug not only shortens labor, but also annuls pain. Doléris (*Therapeutic Gazette*, 1889, p. 733) is reported by Fischel (in the *Wiener Medicin. Presse*, April 26, 1886) to have applied it to the vaginal mucosa and the external genitals in aqueous solution or in the form of an ointment, the strength in either case being four per cent. The amount used was from forty to sixty drops of the solution and from forty-five to sixty grains of the salve. In this manner practically painless delivery was effected in thirteen out of fifteen primiparæ.

A similar class of indications is to be noted in the genito-urinary tract of the male, but perhaps to a less degree than above shown. Otis and many others use cocaine with advantage in urethral surgery to facilitate the passage of sounds or bougies and the stretching and cutting of strictures, also for the relief of ardor urinæ in GONORRHŒA. In all these conditions it may be injected by means of a small syringe. If the effect of the drug is required in the deep urethra, a piece of a soft English catheter may be conveniently attached to the end of the syringe and carried down to the desired point, the solution being slowly injected in advance of the instrument. We have sometimes used in a sensitive urethra, preparatory to the passage of a bougie, a probe tipped with a swab of cotton, which was saturated with a ten per cent. solution of cocaine, and carried slowly and gently down the urethra to the point of stricture, and then removed. German (*Lancet*, February 28, 1885) speaks in the highest terms of cocaine injected into the bladder in CHRONIC CYSTITIS with frequent micturition. One-third of a grain of the drug in four or five ounces of water was retained in the bladder for ten minutes. The freedom from pain lasted for about twenty-four hours, but without effect on the disease.

In SOUNDING FOR STONE in an irritable bladder, cocaine may be used by injecting a solution containing ten grams in four ounces of water. This will usually allay the sensibility. A case of LITHOTRITY is reported (*Lancet*, January 17, 1885), in which after an injection of cocaine, as above directed, a painless operation was performed in fifteen minutes.

Cocaine has been used with considerable success in CIRCUMCISION, the circulation being controlled either with a rubber cord around the penis, or with a pair of Ricord's forceps adjusted tightly over the redundant prepuce, after which from ten to fifteen drops of a four per cent. solution were injected into the cellular tissue of the prepuce about the line of the proposed incision. If care is exercised in following this method, none of the solution will find its way into the general circulation, and the operation is painless.

In the treatment of HYDROCELE by iodine injections, Spilmann (*Gaz. Médicale de Paris*, May 10, 1890) recommends the injection into the cavity of the tunica vaginalis of a ten per cent. solution of cocaine which is allowed to remain for a short time, after which the sac is tapped with a trocar, and then injected with iodine. By this means the entire sac is brought under the influence of the drug, the quantity of the fluid injected varying with the volume of the hydrocele.

In the treatment of RECTAL DISEASE of both sexes cocaine is of established value. FISTULOUS TRACTS may be slit up without causing pain after packing them with cotton soaked in a twenty per cent. solution and allowing the cotton to remain for a short time. If the opening is too small to admit of packing, each tract may be injected with the solution from the nozzle of a small syringe, after which it can be opened and treated as if the patient were under a general anæsthetic. In examinations for ulcers and fissures a probe wrapped with a pledget of cotton saturated with a ten per cent. solution of cocaine may be gently introduced into the rectum before the introduction of the speculum, and the cotton may be allowed to remain for about ten minutes, after which a finger or instrument may be introduced. EXTERNAL HEMORRHOIDS, with great protrusion and pain, may be painted with a ten per cent. solution a few minutes previous to the necessary manipulations for their reduction.

Cocaine was much used at one time in the Pennsylvania Hospital in operations for the removal of small tumors etc. The method employed was as follows: The circulation was controlled by a rubber band placed on the proximal side of the part to be operated upon ; then several hypodermic injections of a four per cent. solution were thrown into the tissues. After all necessary steps were completed bleeding was encouraged, in order to remove as much as possible of the drug. When more than one digit is to be removed, the greater quantity of cocaine is necessarily an element of danger, and suggests the preference of a general anæsthetic. Operations for the relief of DUPUYTREN'S CONTRACTION OF THE FINGERS, for the OPENING OF FELONS and PALMAR ABSCESSES, and for the removal of SMALL NEOPLASMS, can be done with safety under cocaine as well as minor operations on the leg, thigh, forearm, and arm. In such cases a drachm of a four per cent. solution can be used with safety. For operations upon the trunk, when the rubber tube cannot be used, immediate absorption of the drug renders greater precaution necessary. If for this class of cases cocaine be preferred to ether or chloroform, the technique of the operation will differ materially from that described above. Take the removal of a fatty tumor as an example. In the proposed line of incision the needle point should be carried into the deeper layers of the skin (not into the subcutaneous fat, for it is desired to reach the end of the sensory nerves in the papillary layer), and one-half to one minim should be forced out; then the needle should be advanced a fourth of an inch, and the injection again essayed, and so on, as far as the needle will reach from the original puncture. The needle is then re-inserted and the process just described repeated until the line of anæsthesia is established. By this means an incision as long as three inches may be made without pain.

This method may be employed in the removal of SMALL NEOPLASMS, MOLES, CICATRICES, etc., covering an area of not more than three or four square inches. The anæsthesia is almost instantaneous, and is evidenced by the pallor of the overlying skin. After the removal of the growth, it is well not to check too quickly any capillary oozing.

Diseases of the Skin.—Cocaine is employed in diseases of the skin for its anæsthetic effect alone. Under ordinary circumstances neither the crystallized hydrochloride of cocaine nor its solution will penetrate the epidermis. If, however, a strong solution of the drug is placed upon the unbroken skin and a current of electricity, from five to twenty cells of the ordinary constant-current battery, is passed, the anæsthetic influence of the cocaine appears to penetrate a short distance. This circumstance is taken advantage of in the removal of SUPERFLUOUS HAIRS.

When the true skin or a mucous membrane is exposed to the influence of the cocaine, anæsthesia results, from the absorption of the drug.

In PRURITUS, particularly in PRURITUS OF THE VULVA, a condition of hyperæsthesia is sometimes induced which is difficult to allay. Nervous crises result, when the influence on the general nervous system is so great as to produce an almost epileptiform attack.

Under these circumstances a strong solution of cocaine, in even a small quantity of the finely powdered drug, applied to the clitoris will permit the employment of astringent washes or other preventive measures directed to the removal of the exciting cause.

No fear need be entertained in these cases of any constitutional effects, unless the drug be frequently repeated and in considerable quantities.

As an anæsthetic to prevent pain in the application of caustics, cocaine hydrochloride is of marked value. A strong solution applied to the surface of an IRRITABLE ULCER, or to an EPITHELIOMATOUS ULCER, will dull the sensibility of the parts to such an extent that a strong caustic can be applied with little or no suffering on the part of the patient. The anæsthetic effect is transitory.

A convenient formula for the use of oleate of cocaine in PRURITUS ANI, etc., is the following: ℞. Cocain. oleat., gr. vj; lanolin, ʒvss; olei olivæ, ʒss. M.

Diseases of the Ear, Nose, and Throat.—Applications of solutions of cocaine upon any portion of the mucous surface of the nose and throat are followed by diminished redness, pallor of the membranes owing to the constriction of the blood-vessels,* and also by a slight sense of numbness. The effect is in no sense diffusive. In the pharynx and larynx a peculiar dry sensation is also acknowledged and complaint is made of a disposition to useless swallowing; in some instances the feeling is one as though the throat was being grasped from without, or as if it were obstructed by a foreign body. Three to five minutes are required to produce complete anæsthesia, though from fifteen to twenty minutes may be demanded for deep impressions.

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* Cocaine sometimes does not constrict blood-vessels, as in ŒDEMATOUS CHRONIC INFLAMMATION, and in some forms of MEMBRANOUS RHINITIS.—F. H. Potter (*Journal Laryngology*, March, 1889).

Keegan has reported its use in HYDROPHOBIA. A five per cent. solution was painted freely over the back of the pharynx and upper portion of the larynx, and in five minutes the patient was able to drink twelve ounces of milk and eight of water. The following day the application was repeated, and a large amount of fluids was readily swallowed. The patient subsequently died of heart failure.

Less than twenty per cent. solutions appear to be futile in operations on the ear; about five minutes is required before it is fairly absorbed. A four per cent. solution dropped in the ear will occasionally control TINNITUS AURIUM (*Year Book of Treatment*, 1885). S. M. Burnett (*Archives of Otology*, No. 1, 1887) finds cocaine useful only in superficial inflammation of the outer and middle ear. G. P. Field (*Year Book of Treatment*, 1887) thinks nothing less than a twenty per cent. solution of hydrochloride of cocaine is of any use in these affections. A. G. Hobbs (*Archiv Otology*, 1885) throws a four per cent. solution into the middle ear in painful affections of the auditory apparatus. He claims that the tympanic membrane acts as a poor conducting medium.

In the nostrils solutions of cocaine have varied use. As an aid to diagnosis it is almost indispensable, since the erectile tissue is constricted and thereby permits the deeper parts to be illuminated. A two to five per cent. solution suffices for the purpose. To avoid the unpleasant sensation which ensues when the agent is applied to the pharynx no excess should be allowed in making applications. Hence the cotton carrier is to be preferred to the syringe or the atomizer. Sajous applies the cocaine by applying paper pledgets to the interior of the nostril which have been previously immersed in a two per cent. ointment made with cosmoline. In the form of a powder, cocaine may be diluted in any desired proportion with bismuth subnitrate, starch, or sugar of milk. Dilution with magnesium carbonate breaks up the hydrochloride. H. C. Wood recommends the use of the NASAL BOUGIE, which carries the agent mixed with cocoa butter or glycerin. It is not likely that by this means the drug reaches a plane above the level of the inferior turbinated bone. J. M. Mackenzie (*Trans. Am. Laryng. Ass'n*, 1887, p. 159) asserts that when cocaine is habitually over-used the nasal mucous membrane permanently assumes a peculiar puffy appearance.

The addition of one and a half grains of cocaine to one hundred parts of indifferent medium forms an ingredient of a snuff for NASAL

CATARRH. Rabow (*Deutsch. Med. Wochenschr.*, 1886, p. 77). A small quantity of cocaine added to Dobell's solution (boric acid being substituted for borax) is sometimes useful in aborting ACUTE CORYZA.

The use of cocaine in the nostril is in the main to constrict the erectile tissue and the sensitive nerve-endings in ACUTE CORYZA and in HAY FEVER. During the stage of congestion of coryza the relief obtained from its application is immediate. In this instance the spray or lotion or powder is preferable to the direct application. In the acute exacerbation of HAY FEVER in like manner solutions of cocaine, varying from one to five grains to the drachm of water, affords marked relief. Rumboldt (*Amer. Rhinolog. Ass'n*, October, 1886) speaks of the congestion which sometimes ensues after prolonged use of the agent in this disease. Cocaine habit is easily induced by the use of cocaine on the nasal mucous membrane and the systematic employment of the remedy in CHRONIC NASAL CATARRH accompanied with obstruction to breathing should be interdicted. A twenty per cent. solution is used by Sajous as an application in UVULITIS. J. N. Mackenzie (*N. Y. Med. Journal*, October 3, 1885) believes that cocaine applied to the pharynx produces isolation of the "temperature sense." After complete analgesia had been produced the subjects were able to distinguish between hot and cold applications.

The larynx is less susceptible to the action of the drug than either the pharynx or the nose, and anæsthesia is here less easily induced. A solution of a strength from ten to twenty-five per cent. is recommended for adults, a five per cent. solution in women and nervous persons and in children. Gougenheim (*Société Therapeutique*, April 27, 1887).

A twenty per cent. solution mixed with an equal quantity of listerine is recommended by Sajous as a local application in ACUTE LARYNGITIS attended with submucous infiltration. "The antiseptic action of listerine adds greatly to the detergent effect of the mixture and renders it less liable to undergo alteration."

The most important indication for cocaine in laryngeal diseases is the treatment of TUBERCULOSIS. No agent equals it in overcoming the DYSPHAGIA which is so commonly present in the last stage of the disease. A spray of cocaine a few moments before food is taken enables the patient to swallow with comparative comfort. It may be combined with morphine. Cocaine may be used in insufflation in the proportion of one to ten to the bulk of indifferent material, or it may be combined with iodoform or iodol. A powder composed of two-thirds of boric acid with one-third iodol is efficacious.

Cocaine applications to the larynx are often made to induce anæsthesia prior to operation, such as curetting or intralaryngeal removal of TUMORS. For this purpose it is recommended that a solution from ten, twenty to twenty-five per cent. be employed. The fluid can be painted over the affected surfaces, sprayed or injected by a Heryng or Krause' directly into the masses to be treated.

In the local treatment of the paroxysms of WHOOPING COUGH has a well-sustained reputation. According to J. Prior (*Berlin Kli enschr.*, 1885) the frequency of the paroxysms is remarkably di after the use of a ten to twenty per cent. solution. In the judg American observers this strength is much too high to be used wi in children. L. E. Holt (*N. Y. Med. Journal,* October 23, 1886) that a four per cent. solution is the maximum strength that should

The use of cocaine upon the vocal cords should be practic extreme caution when exacting use of the voice is expected a sh afterward. T. A. De Blois (*Trans. Amer. Laryng. Ass'n.*, 1887, speaks with emphasis of the distressing influence resulting fr neglect of this precaution. There appears to be a certain a relaxation of the vocal cords produced, so that, although the p sides, it does not seem to give tone to the parts.

The disposition for cocaine to excite secretion of the laryngea can be overcome, according to Sajous, by inducing the desir anæsthesia quickly by the use of small quantities of a strong rather than by the prolonged use of a weak preparation.

Compressed tablets of cocaine ordinarily contain from one-qu a grain to two grains. Lozenges contain one-twelfth to one-si grain of the drug.

Diseases of the Eye.—Since Koller called attention to th thetic effect of cocaine upon the eye, in 1884, it has naturally a much attention, has been the subject of a number of experime clinical observations by various authors, and has acquired an im place in ophthalmic surgery. For the suppression of CONJU and CORNEAL SENSATION a four per cent. solution is most fre used; a stronger solution is rarely employed, and some surgeon that a two per cent. solution, while more safe, is, if properly a equally efficient. After a single application of the former, an appears in from ten to twenty minutes, and lasts about ten m Usually two or three instillations are made at intervals of five minutes, and this produces a partial anæsthesia also of the iris, result of absorption. Subcutaneous and subconjunctival injecti not now much used, as their results have been found to be so dangerous and never very satisfactory.

Dilatation of the pupil commences in about ten minutes after the cation of a four per cent. solution, reaches its maximum in about an and disappears in from ten to twenty hours. It is preceded by contraction. Incomplete reflex contraction to bright light re Cocaine produces dilatation of the pupil chiefly, if not entirely, by ulation of the sympathetic nerve, though some authorities think that it has also some paralyzing effect on the iritic filaments of the oculo-motor. Mydriasis from section of the third nerve, as also that from atropine, is increased by it. It has no effect on the pupil when the sympathetic is divided, and fails to act in birds, whose iris muscles are striated. Its effect on the accommodation is comparatively slight. Widening of the palpebral fissure, similar to that found in exophthalmic goitre, and the suppression of winking are supposed to be due to contraction of Müller's involuntary orbital muscular fibres, though some influence may be attributed to absence of reflex from the anæsthetised cornea and conjunctiva. Cocaine increases the absorbing power of the cornea, probably by diminishing the amount of fluid in its lymph spaces. Anæmia of the conjunctiva and diminished secretion of tears are results of contraction of blood-vessels, and decreased intraocular tension may be due to the same cause. The latter effect in healthy eyes is generally admitted, but several cases have been reported in which glaucoma was said to be induced by its use. It is possible that the mechanical effect of a widely dilated pupil (see article on atropine) might hasten the onset of an attack of glaucoma, but the cases reported are much too few, compared to the enormous number of applications of cocaine made daily all over the civilized world, to exclude the probability of coincidence. The danger of constitutional effects resulting from the application of cocaine to the eye is so slight that it may practically be disregarded. A few cases have been recorded in which some inconvenience was occasioned, but in none were the symptoms alarming (Frost, *Am. Jour. Med. Sci.*, April, 1887).

A real danger, however, is sometimes met with in its effects upon the cornea, whose nutrition seems to be profoundly influenced by strong solutions. Some surgeons have thought that a loss of firmness and elasticity of the cornea, a flaccid condition, produced by its use, might interfere with the accurate coaptation of incisions, but no serious difficulty seems to have been experienced from this cause. Its occasional injurious effect upon the corneal epithelium is well established. Disturbance of this causes loss of polish and haziness of the cornea, with superficial depressions due to thinning of the epithelial layer and consequent slight derangement of refraction, or there may be vesication or desquamation. The whole corneal epithelium has been raised in a bleb. Even in these cases there is not usually any permanent injury if the cocaine is promptly discontinued. The loss of moisture is at least an important factor in producing this condition, and in experiments on animals desquamation has been prevented by keeping the eyes closed. Cases have been reported in which the anæsthesia lasted for several days. (*Annal. d'Oculist*, 1885.) Deeper corneal lesions are more rare, but in quite a number of cases the use of cocaine has been followed by interstitial opacity in the form of striped keratitis. In relation to the latter, the question has been raised whether the opacity was the direct effect of cocaine, or was rather induced by other applications made at the same time, particularly of bichloride of mercury, whose action on the deeper layers of the cornea was facilitated by the increased absorption, which is one of the results of cocainization. Würdinger (Frost, *Ibid.*) found that solutions of borax, boric acid, corrosive sublimate, and even of common salt, produced the same kind of turbidity in the cocainized cornea.

Mittendorf (*Am. Ophthal. Soc.*, 1888) reports three cases in which cocaine caused Acute Conjunctivitis, with tense, swollen lids, and profuse muco-purulent discharge, similar to that occasionally met with as an effect of atropine. This must be attributed to a very rare idiosyncrasy, but the tendency to subsequent hyperæmia necessitates caution in prescribing cocaine for continuous use, particularly in strong solutions. Cocaine has been accused of inducing panophthalmitis after cataract extraction, but the reports of cases on which this charge is based are few and do not rigidly exclude other possible causes.

Cocaine is a convenient and safe mydriatic for ophthalmoscopic purposes. As it only slightly impairs the accommodation, and its effect on the pupil passes off in a few hours, it can often be used when other mydriatics are inadmissible. It is easy to neutralize its effects by eserine, and it is well to do so when there is any suspicion of a tendency to glaucoma. According to Jackson, its effect on the pupil is neutralized by one-fiftieth of its weight of eserine, while Jessop's estimate is one-twenty-sixth. It is probably not possible to strike an exact balance, but, practically, a solution of half a grain to the ounce of eserine may be depended upon to obviate any inconvenience from the use of the four per cent. solution of cocaine.

Therapeutically, the value of cocaine as an anodyne is limited by the transient character of its action and the inconveniences and even dangers that may result from its too frequent or long-continued use. In small proportions (one or two grains to the ounce) it may be conveniently and safely added to astringent or antiseptic washes to modify their irritating effects, and full anæsthesia greatly facilitates the application of caustics or the use of the actual cautery. It is frequently combined with atropine in the treatment of Iritis, not only for its anodyne effect, but because it assists in dilating the pupil both by its own action upon the iris and by increasing the absorbing power of the cornea.

Cocaine, however, finds its widest field of usefulness in operative ophthalmic surgery. The anæsthesia produced by it in the conjunctiva and cornea is complete, and any operation involving these tissues only is rendered absolutely painless. It is almost universally used in extraction of cataract and in iridectomy. The pain caused by cutting the iris is not entirely avoided, but is much diminished if several applications have been made. In tenotomy of the external ocular muscles cocaine should be dropped occasionally into the wound as the operation proceeds. It has been used in some cases of ENUCLEATION, but is not to be recommended in this operation unless there are strong contraindications to the use of ether. Injections of cocaine by means of Anel's syringe give much relief in probing the lachrymal duct. In operations on the conjunctiva, even under ether, cocainization is useful in diminishing HEMORRHAGE.

COCAINÆ PHENAS. Phenate of Cocaine.

Phenate of cocaine is a new compound of phenol and cocaine, but little used as yet in this country. The combination appears to be a favorable one, owing to the therapeutical properties of phenol, thus differing from hydrochloric acid, which is only useful in rendering the cocaine freely soluble. When freshly prepared it is of a soft consistence and has an agreeable phenylic odor. Phenate of cocaine is soluble in alcohol (50°) and in ether. From the alcoholic solution aqueous solutions may be obtained.

Diseases of the Nose, Throat, etc.—It possesses all the properties of the hydrochloride of cocaine as the effects of this salt are observed upon the nose and pharynx. It is much more agreeable to the taste than is the hydrochloride, and we are inclined to think it will prove to be the preferable agent in laryngological work. It is added to boric acid, salts of bismuth, etc., as an ingredient of nasal snuff. (*Jour. de Méd. de Paris*, April 3, 1892.)

COLLODIUM. Collodion.

Collodion is made by dissolving a gun cotton, pyroxylin, in ether containing a little alcohol. Collodion dissolves nearly all the substances that alcohol or ether will dissolve, so that many collodions are made. The following are official in the United States Pharmacopoeia: *Cantharidal* or *Blistering Collodion* (made by percolating cantharides with chloroform and adding collodion); *Flexible Collodion* (made by adding five per cent. of Canada turpentine and three per cent. castor oil to collodion); two parts of glycerin to one hundred of collodion produces a somewhat similar substance; *Styptic Collodion* ("Richardson's Styptic"), made by dissolving twenty parts of tannic acid in a mixture of collodion, alcohol, and ether to make one hundred parts.[*] Collodions containing iodine, chloride of mercury, iodoform, etc., are also used.

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[*] This formula is a modification of Richardson's "Styptic Colloid" which was composed as follows: ℞. Acid tannic., ℈ iv; alcohol. absolut., ♏xx; ætheris, ♏c; collodii, q. s. ad f℥j. M.

General Surgery.—Collodion was introduced into surgery as a substitute for adhesive plaster by Maynard, of Boston. Its action is twofold: first, drawing together and holding in apposition the edges of a wound, and, second, preserving them from contact with the air. When used in the form of the gauze and collodion dressing, which was introduced into practice in Philadelphia by the late P. B. Goddard, it is much more permanent than the ordinary plaster. The gauze and collodion dressing is thus employed: Strips of tarlatan or mosquito netting, or—what is better—Donna Maria gauze, about half an inch to an inch wide and three to five long, are laid across the lips of the wound, previously washed and dried, and secured with collodion applied with a camel's hair brush first to one end, then, when this is firmly adherent and dry, to the other. With neatness and care a superficial wound can be closed in this way almost as firmly and accurately as by the use of sutures. The strips will remain for a long time, as the dressing is impermeable to water, and the wound may be hermetically sealed by extending the application over the surface as well as on either side. A styptic collodion may be made by dissolving tannin in it. It may be used with advantage in cases in which there is a tendency to ooze. Carbolic acid or iodoform may be combined with collodion to conform to the antiseptic mode of dressing. In superficial wounds about the face and scalp the collodion and gauze dressing will be found most convenient. It is open to the objection that pertains to all adhesive dressings which are applied to the shaven scalp or face, namely, that in a few days the short hairs grow up underneath and cause the entire dressing to become loose.

A. Hewson ("The Use of Earth in Surgery") claims that collodion makes a dressing so firm that any degree of traction necessary may be made from it. According to this writer, it should not be, as a rule, brought in contact with the lips of a wound unless it is expected that union be other than that by first intention. In wounds that cannot be readily inspected the lips can be brought firmly together by the aid of collodion gauze and yet the oozing escape through the meshes. Venice turpentine is sometimes used in the arts to diminish the contractility in the collodion film; such a preparation is unsuited for surgical purposes. Its use has been known to excite inflammation and vesication. Collodion is very useful to retain small antiseptic dressings about the face. The dressing is applied in the usual manner, covered with cotton, around the edge of which collodion is painted, causing it to adhere firmly to the skin. If thought necessary, the entire mass may be coated with the collodion, but painting the edges will ordinarily suffice. The contractile character of collodion makes it of service in the treatment of small Boils and Pimples. In such cases the collodion, applied in the earliest stage, is often effectual in arresting their development. Should it fail in effecting this, it should be still persevered with, as it allays the pain and irritation and apparently hastens the curative process. Its success is mainly due to the pressure that it exerts. If pus should accumulate beneath this covering, causing pain, the collodion should be incised and the pus allowed to escape, and the subsequent treatment carried out under the antiseptic method. Contractile collodion (to which a little iodine may be added) painted over the inflamed part in ACUTE GOUT will relieve the pain, though for a short time it increases it. Too many coats must not be applied, as the contraction is great and dragging on the skin results. Care must be exercised not to include superficial hairs, as they excite unnecessary pain during the contraction.

Hill and Cooper have advised the application of several coats of contractile collodion over the scrotum in EPIDIDYMITIS. The ether acts as a slight counter-irritant, and after evaporating leaves a thick film of collodion over the skin. This contracts and slightly compresses the part within. The collodion may be applied once or twice daily while the acute stage continues. If the patient attempts to move about the testicles should be supported in a suspensory bandage well lined with cotton. In the latter stages of the disease, in our experience, nothing is better to remove and hasten the absorption of the inflammatory products than pressure made by strapping with adhesive plaster.

In INCONTINENCE OF URINE in boys it has been advised to apply a little collodion by means of a camel's-hair brush over the orifice of the prepuce, and thus close the exit for the escaping urine. When it is desired to void urine the little ridge or plug of collodion is easily removed with the finger nail. A fortnight's use will sometimes suffice for a cure.

In INGROWING TOE NAIL, collodion, as used by Jno. Neill, is a valuable means of treatment. The cutting of the affected nail is prohibited, and growth is encouraged; cotton is then firmly packed under the free end with a flat probe, passing between the nail and granulations, raising the nail as far from the surface of the toe as possible. After cotton has been thoroughly packed under and around the nail, the entire mass is saturated with collodion and allowed to dry, forming a firm wedge, which protects the toe on all sides from the encroachment of the nail. Over this are applied a few strips of adhesive plaster, which prevent escape of the cotton from its position. With care, in the course of a fortnight, obstinate cases may be almost entirely cured. If this method of treatment is faithfully carried out evulsion will rarely have to be resorted to.

For a reliable combination of collodion and benzoin as a dressing and protectant, see "benzoin." Painful FISSURES of the hands, lips, and other parts of the body may be brought together and protected by collodion until they have a chance to heal from the bottom.

Diseases of the Skin.—The flexible collodion is used as a protectant in CHAPPED NIPPLES and fingers, and also, occasionally, in abrasions and fissures connected with some forms of ECZEMA and in CHILBLAIN. The ordinary collodion is used in NÆVUS on account of its contracting power. It has also been used in FURUNCLE, ERYTHEMA and ERYSIPELAS. It is, however, chiefly used as a vehicle for the conveyance of various medicaments to the skin.

An iodoform collodion (three scruples to one fluidounce) is occasionally employed as an antiseptic dressing in ABRASIONS, etc.

In ECZEMA RUBRUM INFANTILE one of the best applications is the following: ℞. Picis liquidæ *seu* ol. cadini, ʒj; collodii, f℥j. A camel's-hair brush should be inserted in the cork and the parts should be painted one or more times daily. In that very common form of infantile eczema when the cheeks are found to be inflamed, weeping and excoriated from scratching, this application is superior to ointments of any kind, because it acts as a protectant and cannot be rubbed off. On its first application some smarting occurs, but this soon ceases and great relief is commonly experienced. The paint should not be allowed near the outer canthus of the eye.

In EPHILIS, or FRECKLES, the following solution may be employed: ℞. Zinci sulpho-carbolat., gr. v; alcoholis, fʒss; collodii, f℥j; M. This should also be supplied with a camel's-hair brush in the cork, and may be painted on the freckles at night.

A solution of eight grains of the bichloride of mercury to the drachm of collodion forms a caustic application for the treatment of small NÆVI. A ring of pure collodion should first be painted around the nævus to protect the healthy integument. A single application is usually sufficient. A dry eschar forms and becomes separated in a few days.

Cantharidal collodion (U. S. P.) is used in ALOPECIA AREATA and in circumscribed patches of CHRONIC ECZEMA to excite an acute inflammatory condition. Its effect is that of an ordinary blister of cantharides, but is more convenient of application.

Diseases of the Ear, Nose, Throat, etc.—Flexible collodion is used as a protectant in ZOSTER attacking the external auditory passage. (Keene.)

A saturated solution of tannic acid and gun cotton in ether can be used as a styptic and protectant. It can be applied with a brush or mixed with an equal quantity of ether, and with care even used in the form of a spray. The following table of the proportion of various agents which are available for combination with collodion will prove useful.*

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* "Dental Therapeutics," J. W. White.

With creasote,	1 minim to 2 drachms.
With carbolic acid,	2 minims to 2 drachms.
With quinine,	2 grains to 2 drachms.
With iodine,	5 grains to 2 drachms.
With morphine,	1 grain to 2 drachms.

A mixture of collodion and carbolic acid is used for TOOTHACHE where pulp is exposed.

Diseases of the Eye.—Collodion forms a neat dressing for wounds about the eyelids or brow. A strip of fine gauze is laid across the wound and collodion is painted over it with a brush. It forms a protective coating and its contraction brings the edges of the wound in close apposition. This property of contraction can also be made useful in cases of ENTROPION of the lower lid from relaxation of the skin, such as is sometimes met with in old people. It is freely painted over the skin, either with or without the interposition of gauze or of a thin layer of absorbent cotton.

CONIUM. Hemlock.

"The full-grown fruit of *Conium maculatum*, gathered while yet green." (U. S. P.) Conium contains a volatile alkaloid, Conine (Conia). Conine is "a yellowish, oily liquid, of a very acrid taste and a strong, penetrating odor, compared to that of the urine of mice. It is volatile and is freely soluble in alcohol, ether, the fixed and volatile oils, and slightly so in water." (U. S. D.) The pure alkaloid, and the hydrochloride which is freely soluble in water, are used in medicine. The official preparations of Conium are *Abstractum Conii* (one part representing two parts of the drug), *Extractum Conii Alcoholicum* (of uncertain strength), *Extractum Conii Fluidum* (one cubic centimetre representing one gramme of the drug), *Tinctura Conii* (containing the activity of fifteen parts of the drug in one hundred parts of the tincture). It is one of the ingredients of baume tranquille.

Conium is sedative.

General Surgery.—Conium has long been employed locally in medicine, especially in the treatment of CANCER, for which the older surgeons have held it in high esteem. S. W. Williams, of Massachusetts (*American Journal of the Medical Sciences*, ix, 1879), quoted by A. Stillé, reports six cases of ulcerated cancer of the breast, all but one of which were healed under its use. The drug, when applied locally, possesses some sedative properties. A poultice composed of two parts of bruised hemlock leaves and six parts of flaxseed meal, with boiling water, has been used as a soothing dressing for painful swellings. The poultice should be applied with caution where there are abrasions or ulcerations, for fear of too active absorption.

In CANCER, hemlock has fallen into disuse as a curative agent by modern surgeons, but the pain of ulcerating cancer of the breast may be mitigated by the use of hemlock poultices, while lint, saturated with succus conii and placed over the diseased surface, may prove useful as an anodyne dressing (Waring).

In uterine and ovarian diseases conium has been found of service. In UTERINE CANCER Dewees advised an injection of the extract, three fluid ounces to one pint. Meadows regards conium as the best anodyne for the generative tract, especially in ovarian MENORRHAGIA, for which he advises that a vaginal suppository of one or two grains of conium, made with glycerin one part and gelatin four parts, be introduced once or twice daily. In TRAUMATIC TETANUS Johnston, of Baltimore, has employed conium hypodermically with asserted success, injecting every two hours fifteen minims of a solution composed of two minims of conium, one minim of dilute sulphuric acid, and one drachm of water.

Diseases of the Throat, etc.—Conium is held in high repute as a sedative in affections of the throat. Succus conii two drachms, water one pint to twenty ounces, form the basis for an inhalant which appears to be specially adapted for the relief of pain in ACUTE LARYNGITIS. English writers recommend the addition of twenty grains of sodium carbonate to the fluid, since this agent sets free the conine.

Harley uses conium to produce relaxation of the œsophagus in cases of impacted foreign bodies. (Leffmann, *Amer. System of Dentistry*, Vol. iii, p. 694.) Conium has a disagreeable, mouse-like odor, which renders its use in the nose and throat objectionable to some persons.

COPAIBA.

The oleoresin of *Copaifera langsdorffi* and other species of *Copaifera*. (U. S. P.)

Copaiba is protectant, antiseptic, and antiphlogistic.

General Surgery.—Copaiba was largely used a hundred years ago in the London hospitals as a topical application for the treatment of chronic and INDOLENT ULCERS. Within the last two years its use has been revived by Dr. Beach, in the Massachusetts General Hospital, in the treatment of similar conditions. Cotton waste, or charpie, saturated with the balsam, is laid on the ulcer and retained by a firm bandage. It is claimed that it is especially adapted to the flat, pale, granulating surfaces that commonly result from the EVULSION OF THE SCALP, EXTENSIVE BURNS AND SCALDS, OPERATIONS for the removal of NECROSED BONE, etc.

Diseases of the Throat.—Twenty-five minims in a half pint of water may be dropped in the presence of one-half drachm of magnesia. A drachm of this added to a pint of hot water is used for inhalation.

COTOIN.

Cotoin is an alkaloid obtained from different species of *Coto bark*. "It is sparingly soluble in cold water, more soluble in hot water, insoluble in benzin, very soluble in alcohol, chloroform benzol, acetone, and bisulphide of carbon. It occurs in large, glistening, laminated crystals of a pale yellow color." (U. S. D.)

Diseases of the Nose, etc.—The effect of cotoin is described by E. L. Shurly (*N. Y. Med. Journal,* September 11, 1886) as a powerful irritant when applied to the pharyngeal and nasal membranes; he believes that when diluted with either starch or sugar one part to three or four is particularly well-adapted to the treatment of ATROPHIC CATARRH.

COUMARIN.

A crystallizable substance obtained from the seed of *Dipteryx odorata* and *Coumarouna odorata.* (Tonka Bean.) It is freely soluble in alcohol, ether, chloroform, and bisulphide of carbon, and is also soluble in hot water, from which it is deposited on cooling.

Coumarin has been proposed for covering the odor of iodoform.

CREASOTUM. U. S. Br., Creasote. Creosote.

"A product of the distillation of wood tar." (U. S. P.) It is an oily liquid, of a reddish amber color, smoky odor, caustic taste, and neutral reaction. Its physiological action and antiseptic properties are almost identical with those of carbolic acid. The best creasote is known as "*Beech-wood creasote,*" and is made from the tar resulting from the distillation of beech-wood.* The older the article the better it is tolerated. Creasote is "soluble in about eighty parts of water at 15° C. (59° F.) to a somewhat turbid liquid, and in twelve parts of boiling water. It dissolves in all proportions in absolute alcohol, ether, chloroform, benzin, disulphide of carbon, or acetic acid." (U. S. P.) Solutions should be made in the presence of glycerin.

The peculiar odor of creasote can be modified by combining with camphor in proportion of twenty grains to the ounce of creasote.

The following tests will prove of value: "One volume of liquefied carbolic acid containing five per cent. of water forms with one volume of glycerin a clear mixture, which is not rendered turbid by the addition of three volumes of water. If one volume of creasote be mixed with one volume of glycerin a nearly clear liquid will result, from which the creasote will be separated by the addition of one or more volumes of water." (U. S. P.)

Creasote is caustic, hæmostatic, antiseptic, deodorant, antipruritic, analgesic, astringent, yet strongly excitant.

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* W. C. Glasgow (*Trans. of the American Climatological Association,* 1891, 263) states that after trying various articles sold under the name of creasote he is convinced that the *English beech-wood creasote,* prepared by Morsen, is the only one adapted for medicinal purposes.

General Surgery.—Creasote water has been used locally as a hæmostatic, and is of value as a wash for FOUL SORES and SLOUGHING ULCERS. In advanced stages of CANCER of the uterus West advises a lotion made of one drachm of creasote and one pint of mucilage as having a marked influence in removing the offensive odor.

WARTS are said to be removed by creasote freely applied and kept in situ for two days by a strip of adhesive plaster. It requires to be subsequently used until desquamation ensues.

In GANGRENOUS STOMATITIS creasote may be applied after the removal of the slough. Koch advises the following ointment in the treatment of ERYSIPELAS: Creasote and creolin, each fʒj; iodoform, ʒiv; lanolin, ℥x; the ointment to be spread evenly with a camel's-hair pencil in a thin layer over the affected part; the part is to be covered with rubber cloth or gutta-percha.

A one per cent. solution of creasote in combination with boric acid has been used as an injection for GONORRHŒA. The efficacy of this preparation depends in great part upon the germicidal effects.

Diseases of the Skin.—Creasote has often been confounded with carbolic acid, as if it were an impure variety of the latter, but its therapeutic effects are somewhat different.

In its pure state it may be brushed over INDOLENT or GANGRENOUS ULCERS beneficially, but placed in contact with the healthy skin for ten or twenty minutes it induces superficial inflammation. It has been employed to remove NÆVI, applied two or three times a day, more or less diluted. Excoriation, ulceration, and gradual disappearance of the nævus ensues, leaving a smooth and sound cicatrix. (Bulkley, "The Local Use of Tar and Its Derivatives," *Arch. Sci. and Pract. Med.*, April, 1873.) According to Bujalsky, NÆVI may be removed by penciling them twice daily for some weeks.

The chief value of creasote is as an ANTIPRURITIC. It is superior in this respect to carbolic acid, but its acrid and penetrating odor is a bar to its general use. Tilbury Fox recommends the following formula for use in PITYRIASIS CAPITIS: ℞. Creasoti, ♏xxx; glycerini, fʒiij; aquæ, f℥v–f℥viij. M.

In CHRONIC PSORIASIS Squire recommends an ointment of two parts creasote and one part white wax, to be rubbed in night and morning. We think, however, that this is much too strong to use without great caution, in consideration of the caustic properties of the pure drug. Tilbury Fox used an ointment of six drops of creasote with six grains of the red oxide of mercury to the ounce of lard in PSORIASIS.

IN CHRONIC ECZEMA creasote ointment, ten grains to the ounce, is useful to allay itching. It may also be employed in lotion for this purpose.

In ERYTHEMA CALORICUM (chilblains) Devergie advised the following ointment: ℞. Creasoti, liq. plumbi subacetat., āā ♏x; ext. opii, gr. jss; adipis, ℥j. M. Creasote has also been recommended in ERYSIPELAS, in the strength of two drachms to the ounce of lard; a rather strong application, we think, but an almost specific effect has been claimed for it.

In TINEA SYCOSIS White recommends the following: ℞. Creasoti, ♏xv; ung. hydrarg. nitrat., ʒj; flor. sulphuris, ℥ss; adipis, ℥j. M. To be applied every night after depilation, in connection with the use of sulphurous acid as a lotion in the morning.

Diseases of the Ear, Nose, and Throat.—In the strength of two minims to an ounce of lard creasote has been used in CHRONIC ECZEMA of the auditory meatus. Creasote and glycerin, in equal parts, is effective as an excitant in FETID CATARRH OF ATROPHY. The mixture should be applied to small surfaces of the membrane with a brush or cotton carrier. (Ferreri.) A small proportion of creasote may be added to Lugol's solution for use upon the tonsil when chronically inflamed. Its exhibition is indicated in the tumid vascular states which often persist after long-retained pellets of solid secretion have been removed. It acts as an astringent and antiseptic. Creasote checks OOZING after tonsillotomy. In the larynx creasote has long been used as a local medicament in ulceration, either simple or when due to a bacillar cause. Cadier combines creasote one part, alcohol four parts, glycerin sixty parts to ULCERS of the vocal cords and of the posterior region. A gargle containing one to two drops of creasote to an ounce of water is recommended by H. McNaughton Jones as a disinfectant and stimulant.

As an inhalant creasote is one of our most efficient local remedies in CHRONIC BRONCHITIS when dilatation of the bronchi favor the retention of mucus. Four or six minims of creasote mixed with a little magnesium carbonate may be added to a half pint of water.

Creasote is a powerful excitant. Under its influence the vessels become relaxed and hyperæmia is induced. (A. Israi.) Its exhibition, therefore, is indicated when the lung is known to be hyperæmic, but is contraindicated where a tendency to hemorrhage exists.

In CHRONIC LARYNGEAL CATARRH an indication likewise exists for its administration. It has been used in three per cent. solution as an intrapulmonary injection in PHTHISIS. The medicament consists of three per cent. solution of creasote in oil of sweet almond; of this ten minims are injected in a cavity or solidified apex. After fifty such injections a fatal accident occurred, due, as was found by post-mortem examination, to the walls of the cavity being pierced by the hypodermic needle, retaining the puncture as an orifice allowing a free passage of inspired air to enter in the pulmonary cavity. Such methods, therefore, for the relief of phthisis are not to be repeated in the light of this experience. (R. T. French, *Philad'a Medical News*, November 29, 1890.) W. C. Glasgow (*l. c.*) recommends a creasote ointment (proportions not given; vaseline being used as a base) to be applied freely to the chest in PULMONARY PHTHISIS. Such a treatment is an adjuvant to the internal administration of the drug. A lozenge may contain one-half minim of the drug.

A small quantity dropped in boiling water may be inhaled for OZÆNA. A saturated solution of iodine and creasote is recommended by J. W. White as a stimulant to gum tissue and bone. It is also an escharotic to coarse GRANULATIONS and FIBROID EXUDATES. It is useful in the treatment of SYPHILITIC ULCERS of the mouth and pharynx involving bone.

When mixed with vaseline, in the proportion of one-twentieth to one-tenth, Cadier (*British Med. Jour.*, February 22, 1890) claims anæsthetic properties for creasote in the treatment of LARYNGEAL PHTHISIS. As a steam inhalant in CHRONIC CONGESTION of the larynx and trachea the following preparation may be used: eighty minims of creasote, forty grains of magnesium carbonate rubbed up in an ounce of water. Add a teaspoonful of this mixture to a pint of water at 140° F. and inhale. (Lefferts.) The following formula is recommended by Mandl in making a watery solution of creasote: Creasote, six to eight drops; alcohol, five grammes; glycerin, twenty grammes, and water three hundred grammes. For use as a spray, to fifteen ounces of water a drachm and a half of creasote is added in the presence of one ounce of glycerin. In the form of inhalation E. L. Shurly uses one drachm of creasote, two ounces of compound tincture of benzoin in the presence of four drachms of tincture of lupulin. One drachm of this should be added to one pint of hot water and inhaled. Ten drops of creasote added to eight ounces of boiling water forms an admirable inhalation which should be used immediately.

As a local anæsthetic creasote is largely used by dentists for aching teeth with sensitive dentine, and as an application to exposed nerve pulps, the remedy being applied on a little absorbent cotton and inserted into the cavity of the tooth, from which all *debris* of food has been removed by syringing with warm water. In the absence of creasote, the same result can be obtained with carbolic acid and collodion.

CREOLINE. Creolin.

Creoline is one of the cresols, and the cresols are a homologous series of the phenols. "A blackish-brown, thick, alkaline, almost syrupy liquid, freely soluble in alcohol, chloroform, and ether, forming with water a milky, opaque emulsion. It consists principally of coal tar, with some resin soap, fat soap, and caustic soda." ("Nat'l Med. Dic.") Creoline masks the odor of iodoform.

Creoline is antiseptic, disinfectant, and hæmostatic. It is excitant or antiphlogistic according to the strength in which it is used.

Creoline possesses the advantage over many agents of its class in being benign,* non-volatile, and cheap.

The antiseptic properties of creoline have been studied by von Esmarch (*Centralbl. f. Bakteriologie*, 1887, Bd. ii, pt. 95; *Centralbl. f. Bakteriologie und Parasitenkunde*, Bd. ii, 10, 11), who found that a one-fifth per cent. solution destroyed the power of micro-organisms, even though the spores were dry, the necessary time varying from ten minutes to four days, according to the method of exposure and the strength of the solution. In the course of his experiments, solutions of creoline were used on fluids containing cholera, typhus, and anthrax bacilli. In a large majority of cases creoline was much more active than carbolic acid or the weaker solutions of bichloride of mercury. It was also noticed that as a deodorizing agent creoline was superior to carbolic acid. The same authority states that the drug is non-poisonous to animals, even when administered in large doses. The experiments of Eisenberg (*Brit. Med. Jour.*, Nov. 10, 1888) confirm those of von Esmarch, save that his results proved creoline more powerful in destroying anthrax bacilli, while those of von Esmarch made carbolic acid the more efficient agent. Lerumscan (*London Med. Recorder*, May 21, 1888) is emphatic in his assertion that creoline is inoffensive to both man and the lower animals, while its germicidal powers are ten times those of carbolic acid, and even more powerful than corrosive sublimate.

Kortum (*Berliner Klinische Wochenschrift*, Nov. 14, 1887) has used creoline extensively, and finds it a satisfactory antiseptic, having at the same time deodorizing, stimulating, calming, and curative properties. He uses a two per cent. solution in preparing the hands for operation. The part is washed with a similar solution, and, as it is non-corrosive, he recommends it for the immersion of instruments, but for the purpose named it is objectionable, since the watery solution is opaque.

Kortum (*l. c.*) claims success in the treatment of INDOLENT ULCERS. He cites many cases where the cure of large ulcers advanced so rapidly that in eight days a surface only two and one-third inches long by one-third of an inch wide remained. For small wounds and ulcers it may be applied also through the medium of collodion.

Spaeth (*Wiener Medizinische Presse*, No. 8, 1888) reports good results from creoline in a variety of conditions. Gauze is employed dipped in a two per cent. solution and covered with compresses of wool. Th[illegible]e cases so treated embraced examples of severe BURN, varicose ULCERS, and septic wounds. In a patient suffering from PYÆMIA after amputation of the thigh, and who was succumbing to infection despite the use of th[illegible]ne antiseptic dressings, reaction under creoline dressings in two days occurred [illegible]ed, with complete recovery. Other German writers highly recommend creoline as an antiseptic surgical dressing.

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* It is necessary to state that a death, probably due to creoline, is reported from Rosenbach's ward, at Breslau. (*Wiener Med. Presse*, November 11, 1888.) The symptoms were vomiting, sweating, unconsciousness, and collapse. The vomitus was brownish-green in color and smelled strongly of creoline, as did also the urine. Symptoms of carbolic acid poisoning were present at autopsy. A second doubtful case of poisoning is reported. Spaeth took eight grammes per day, with no symptoms, and has administered as much as fifty grammes a day to a dog without results.

Koch recommends the use of the following: ℞. Creoline one part, iodoform four parts, lanolin ten parts, in the treatment of ERYSIPELAS; the ointment to be spread not only on the affected area, but an inch to an inch and a half around it. It is believed that the iodine set free by the combination is an important factor in the results obtained. C. J. Rothe (*Jour. Amer. Med. Assoc.*, p. 228, vol. ii, 1890) has abandoned the use of carbolic acid and iodine in erysipelas, and substitutes an ointment containing three per cent. of creoline.

In one per cent. solution creoline has been used as an injection in GONORRHŒA by Lutaud (*N. Y. Med. Jour.*, March 28, 1891), Kortum (*Berliner Klinische Wochenschrift*, Nov. 14, 1887), and Margariths (*Lancet*, Aug. 18, 1888), with reported success. The former recommends the following prescription in the later stages of GONORRHŒA and LEUCORRHŒA: ℞. Creolini, fʒss; ext. hydrast. Canaden., ʒss; aquæ, f℥iv. M. Sig.—fʒij added to pint of warm water and used as injection.

Th. Parvin (*Med. News*, Nov. 30, 1889) has used creoline injections in CYSTITIS with success, though he considers the two per cent. solution too strong to begin with, recommending a one-half per cent. solution. Jefsner (*Lancet*, January 14, 1888) approves of a one-half per cent. solution, and cites a case that had resisted other treatment that readily yielded to creoline.

Minapoulus (*Wiener Med. Presse*, Nov. 25, 1888) has employed creoline in his obstetric practice, varying the strength of the solution from one-half to two per cent. He used this solution as an injection in the vagina before and after labor, and for disinfecting the hands and instruments. Of 140 cases thus treated, two were severely and nine slightly infected; while of 140 cases in which bichloride was used, three were severely and 13 slightly infected. From these results he considers that creoline compares favorably with corrosive sublimate. Born (*Centralbl. f. Gynækologie*, No. 20, 1888) confirms the high opinion held of creoline by Minapoulus, citing 124 cases, in all of which favorable results were obtained. Baumm (*Centralbl. f. Gynækologie*, No. 20, 1888) has employed this agent with favorable results. He considers a two per cent. solution rather strong, and mentions one case in which fainting occurred, followed by sickness, ringing in the ears, and giddiness, while later the urine passed was dark-colored. He detected no peculiar odor of the urine. Although a post-partum hemorrhage had occurred which might produce these symptoms, he thinks it possible that they were due to creoline poisoning. Hirst, in his lectures to the class at the University of Pennsylvania, commends creoline as the safest antiseptic used in midwifery, and of equal efficiency to bichloride of mercury. Chiron (*Gazette de Gynecologie*, May 1, 1889) has used this antiseptic extensively in female BLENNORRHAGIA and ENDOMETRITIS with success.

Wackez (*Therap. Monatsh.*, June, 1889) has used creoline as a dressing, but complains that a peculiar eczematous rash appeared on the third day, followed by large blebs. A similar action was noted by Boschmeyer (*Therapeutic Gazette*, p. 632, 1890), who adds that children are more susceptible than adults to this complication.

Diseases of the Skin.—Creoline has been recommended as an antiseptic and parasiticide.

It has been employed in ointment, half a drachm to the ounce of lard in SCABIES. It is said to cure the disease very quickly, without irritating the skin.

Diseases of the Ear, Nose, and Throat.—L. Lichwitz (*Le Bulletin Médicale*, No. 78, 1888) believes that creoline is useful in the strength of one part to one thousand for OTORRHEA. Urbantschitsch recommends ten drops to a half litre of water. The solution can be greatly increased in strength. The fact that solutions of creoline are opaque is objectionable, since the presence of the fluid at the bottom of the meatus disguises the appearance of the parts and changes the color of the discharges. All observers agree that secretion lessens. One of the advantages acknowledged is the retention of antiseptic powers below that strength which excites irritation of the tissues. A. Eitelberg (*Wiener Med. Presse*, 1888, No. 13) recommends a solution of ten drops to a half litre of warm water for syringing the ear and for applications to the auditory passage in active INFLAMMATION. Schnitzler used it extensively in form of a gargle, one to five per cent., in different diseases of the throat. A gargle of a two per cent. solution of creoline is advocated for DIPHTHERIA by Roos, and Amon (*Münchener Med. Wochenschr.*, 1888, 26). Owing to its cheapness it is well adapted for dispensary practice. An efficient though not an agreeable gargle can be made by adding two to five drops in a glass of water.

Many observers recently have recommended creoline in OZÆNA, CHRONIC NASAL CATARRH, and PHARYNGITIS SICCA; a solution of one per cent. is sufficiently strong. Pleskoff prepares tampons ten to fifteen centimeters long and about the thickness of the little finger, which, after being wrung out in the creoline solution, are inserted deep into the anterior nares and allowed to remain for twenty minutes, in ATROPHIC CATARRH. In PHARYNGITIS SICCA the tampons are inserted as far as the posterior nares, so that they project into the naso-pharynx. E. O. Otis (*Boston Med. and Surg. Journal*, 1889, 599) also recommends its use in PHARYNGEAL CATARRH. A solution stronger than two per cent. may excite continuous burning, and a solution of from two to five per cent. smarting, if applied to the nose. The same writer uses creoline in ordinary cases of PHARYNGEAL NASAL CATARRH. A solution of a strength of one to two drops in a tumbler of warm water, using the solution with a nasal syringe, suffices. Langmaid has found creoline to be irritating, and believes that its use should be restricted to chronic cases which need stimulation, and the effect should not be continued long.

Schnitzler (*Deutsche Med. Wochenschrift*, Aug. 16, 1888) approves of its use as an ingredient in a gargle for ACUTE TONSILLITIS.

F. W. Koehler (*Med. Record*, Jan. 19, 1889) speaks highly of creoline in the local preventive and curative treatment of infectious throat diseases. The author employs it as a gargle of one to two per cent. solutions.

In a solution of from two to three per cent. it is found to possess hæmostatic properties. It appears to be especially adapted in HEMORRHAGE from mucous membranes. Plugs, which have been previously saturated in such a solution, can be worn for a week without removal.

As an inhalant in PHTHISIS, in the form of creoline vapor, it destroys the fetor and diminishes expectoration. Its effects are nil in arresting the progress of the disease (Sedziak).

A trade preparation containing creoline, known as Jeyes' Sanitary Compound, is used as a germicide. Creoline is the basis of another proprietary article known as Jeyes' Surgical Soap. It has the merit of being cheap, harmless, and efficient.

Diseases of the Eye.—Creoline has been used in PURULENT CONJUNCTIVITIS, KERATITIS, and PHLYCTENULAR OPHTHALMIA, in one or two per cent. solutions, and as an ointment with cosmoline in CILIARY BLEPHARITIS. It resembles carbolic acid in its therapeutic effects, but is less irritating. Its use has not been general, and further experience is required to establish its value. It has been recommended as a disinfectant of instruments, but the opacity of the emulsion that it forms with water is an objection.

CUBEBA. Cubeb.

"The unripe fruit of *Cubeba officinalis* (nat. ord. *Piperaceæ*)." (U. S. P.) The preparations are *Extractum Cubebæ Fluidum*, *Oleoresina Cubebæ*, *Tinctura Cubebæ*.

Cubeb is a stimulant to the nasal mucous surface.

Diseases of the Nose and Throat.—The preparations of cubeb have the same general properties. Finely powdered and blown into the nostrils by an insufflator, it is of established repute for Chronic Nasal Catarrh. It is, nevertheless, of little value other than a palliative to the sense of oppression attendant on turgescence of the membranes. The best remedy for such a condition is the galvano-cautery. Chewing the berries of cubeb has long been a remedy of popular repute in fatigue of the larynx following prolonged speaking.

Inhaling the smoke arising from the burning of cubeb has been for many years a popular remedy for the relief of distresses arising from Turgescence of the Mucous Membrane of the Nose. Smoking cigars in which cubeb is diffused, inhaling vapor of cubeb from pieces of cotton, or other substance saturated with it, or swallowing small pieces of sugar on which oleoresin has been dropped, are useful; but now with the many admirable topical agents in the relief of this affection and the great improvement in the surgical means resorted to in their treatment, cubeb has taken a much less important position than formerly; at best it may be said it excites a peculiar effect on the mucous membrane which is agreeable to the patient and has a transient effect in constricting the arterioles.

Lozenges containing cubeb are sold prepared by different manufacturers, in the proportion of one-sixteenth to one grain of oleoresin; one-half of a grain enters into each Spitta's lozenge.* The amount is, therefore, so variable that care should be taken in directing them to be purchased. W. Murrell (*Brit. Med. Jour.*, 1885, Dec. 12) uses as an inhalant for Winter Cough the oil of cubeb joined with oil of sandalwood and pure terebene in the presence of vaseline.

Oleum Cubebæ. Oil of Cubeb.

" A volatile oil distilled from cubeb. A colorless, or pale greenish, or yellowish liquid, having the characteristic odor of cubeb, a warm, camphoraceous, aromatic taste, and a neutral reaction. It is soluble in an equal weight of alcohol." (U. S. P.)

Diseases of the Throat, etc.—As an inhalant oil of cubeb, in the proportion of ten minims to a half ounce of water, a small quantity of magnesium carbonate being added to better maintain the diffusion, may be employed. A teaspoonful of the mixture should be added to a half pint of water, heated to 150° F. It is a valuable stimulant in Laryngitis, accompanied with relaxed membranes and hypersecretion.

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* Req:	Oleoresin of Cubeb,	ʒj.
	Oil of Sassafras,	♏xv.
	Ext. Licorice,	℥j.
	Gum Arabic,	℥ss.
	Sugar,	ʒvj.
	Syr. Tolu q. s. to mass.	

Fiat troch. No. cxx.

Spitta's lozenge was originally made with about two grains of powdered cubeb in each. The present U. S. P. formula is modeled after that of Spitta, but contains ½ grain of the oleoresin instead of two grains of the powder.

In addition to the above, cubeb combines agreeably with tolu, sassafras, glycyrrhiza, potass. chloras, rhatany, and oil of lemon. A nasal tampon, saturated with a mixture of tincture of cubeb, one ounce, glycerin, ten minims, has been proposed by M. Mackenzie.

"Cubeb Wool."—Cotton, one drachm; glycerin, ten minims; tr. cubebæ, one ounce. Mix the glycerin with the tincture, saturate the wool with the liquid and dry.

CUPRI NITRAS. Nitrate of Copper.

Nitrate of copper is prepared by dissolving copper oxide in diluted nitric acid. The clear solution is decanted from the sediment and evaporated to crystallization. The blue crystalline salt is very soluble in water, has a caustic metallic taste, and cauterizes the skin.

Diseases of the Mouth.—Flemming has used nitrate of copper in TUBERCULOUS ULCERATION of the tongue, and claims a cure.

CUPRI SULPHAS. Sulphate of Copper. Blue Vitriol. Bluestone.

Sulphate of copper occurs in "large, translucent, deep-blue, triclinic crystals, efflorescent, odorless, having a nauseous, metallic taste and an acid reaction. It is soluble in two and six-tenths parts of water at 15° C. (59° F.), and five-tenths of boiling water, and insoluble in alcohol." (U. S. P.)

Sulphate of copper pencils are made in several ways, one is the turning in the lathe of suitable masses of sulphate of copper, another is the mixing together of one part of powdered potassa-alum and two parts of powdered sulphate of copper, fusing and moulding. Still another is to rub together four parts of powdered sulphate of copper and one of powdered borax; there results a plastic mass, which may be shaped to any desired form, and soon after hardens. Crystals of sulphate of copper may be rubbed with a piece of cloth under a stream of water until the desired shape is obtained.

General Surgery.—In the treatment of CHRONIC INDOLENT LEG ULCERS, such as are often found in persons broken down from intemperate habits and neglect, a solution of sulphate of copper (blue-wash), five or ten grains to the ounce of water, can be used with advantage. The following method is recommended: First poultice the parts for several days in order to remove all devitalized tissues. After the surface is fairly clean it is enveloped with lint soaked in the solution. Oiled silk or waxed paper overlies the lint, and a firm bandage is applied from the toes to the knee.

The action of the sulphate of copper on open, granulating surfaces is to coagulate the albumin, and thus a thin, insoluble coating is formed, which takes the place, in a measure, of the lost cuticle, and so promotes the healing process. Sulphate of copper, like many other metallic salts, constricts the blood-vessels and lessens the blood-supply to the part. It may even arrest HEMORRHAGE from small vessels, although for this purpose it is inferior to other substances, such as alcohol or hot water.

Sulphate of copper has long been a remedy among sailors for the treatment of CHANCROIDS. A small lump of the crystal is broken up and the surface of the chancroid is covered with the coarsely-powdered salt, which is retained by means of a bandage. Under this treatment the sore changes its character and heals up rapidly.

Sulphate of copper has long been used with great advantage, as an injection, in the treatment of the latter stage of GONORRHŒA. It should not be used stronger than two grains to the ounce at first. It forms one ingredient of Berkley Hill's "four sulphate" mixture. This preparation is composed of: Sulphate of copper, sulphate of zinc, sulphate of iron, and sulphate of alumina, of each ten grains, and water seven fluid-ounces. We frequently use, with success, at the Pennsylvania Hospital, the following injection: ℞. Cupri sulph., gr. xij; tinct. opii, ℥j; aquæ, ℥v. The patient is always instructed to begin by diluting this to one-half strength with water, and to inject the solution three times daily, after urinating. Injections of sulphate of copper solutions (from five to fifteen grains to the ounce) are often of service in RECTAL ULCER.

Diseases of the Skin.—Several of the salts of copper are employed as applications in diseases of the skin. Their effect is usually astringent and, to a mild degree, parasiticide. The sulphate of copper applied in the solid crystal is a stimulant or mild caustic, and acts favorably in INDOLENT ULCERS, MUCOUS PATCHES, and in FISSURES. The aqueous solution, twenty grains to the ounce, is sometimes used as a lotion in CHRONIC ECZEMA. Besnier, in crusted ECZEMA OF THE SCALP, removes the crusts by means of compresses wet with starch water (a teaspoonful to the quart) covered with rubber cloth, adding a drachm of boric acid to the quart of starch water if the crusts are foul. When inflammation has disappeared a lotion of four grains of sulphate of copper to the ounce of water is employed to complete the cure.

Blanc employs an ointment of thirty grains of the oleate of copper to the ounce of lard in RINGWORM of the scalp.

An ointment of the sulphate of copper was formerly employed, but possesses no advantages over other astringent remedies.

Diseases of the Ear, Throat, and Nose.—A solution of sulphate of copper, ten to twenty grains to the ounce, may be dropped in the ear in the treatment of PURULENT OTORRHŒA, accompanied with PERFORATION OF THE TYMPANIC MEMBRANE. It appears to act much the same as solutions of nitrate of silver of equivalent proportions, and may serve as an efficient alternative with these preparations. Kircher employs weak solutions in CHRONIC SALPINGITIS. Stronger lotions are borne within the naso-pharynx, for example, in amounts of a half drachm to an ounce of water. Its use is indicated in acute inflammation with submucous infiltration, such as is found in SYPHILITIC ANGINA and in the last stages of TRAUMATISMS. In PHAGEDENIC ULCERATION applications in the strength of a scruple to two drachms to the ounce of water is approved by T. F. Rumbold. (*St. Louis Archives*, 1873.) When EPISTAXIS is due to ulceration B. Robinson uses a similar solution mopped over the affected spots. Ten grains to the ounce forms an efficient lotion for recent APHTHOUS ULCERATION of the mouth; in chronic or recurrent forms of this condition the crystal may be used.

As an astringent gargle, ten to fifteen grains to the ounce can be borne. It appears to be especially adapted for diffuse CELLULITIS, as in ERYSIPELAS, BITES OF INSECTS, TOXIC IMPRESSION, etc., as well as in all forms of ANGINA in which the connective tissue is involved, hence it is of value in PHAGEDENIC ULCERATION of the pharynx, whether of specific or other origin. The same strength of solution may be painted with advantage over the gums in STOMATITIS.

In FŒTID CORYZA a lotion of strengths varying from one-half grain to ten grains to the ounce are advantageous.

Diseases of the Eye.—Sulphate of copper is occasionally employed as a collyrium, in the proportion of half a grain to two grains to the ounce, in the treatment of CHRONIC CONJUNCTIVITIS, but its more general use in ophthalmic surgery is in the form of crystal, applied to the everted lid in TRACHOMA. This was formerly in almost universal use, but is less so now, as most surgeons consider it a more painful and less efficient remedy than are solutions of nitrate of silver or the "mitigated stick." In cases under treatment for a long time, however, it is necessary to vary the applications, and the traditional "blue-stone" is often efficient. It is dipped in water and passed over the everted lid, which should be washed before it is allowed to close.

The "Lapis divinus," composed of equal parts of sulphate of copper, nitrate of potassium, and alum moulded into a pencil, is not often prescribed.

CYDONIUM. Cydonium. Quince Seed.

"The seed of *Cydonia vulgaris.*" (U. S. P.) The mucilage of quince seed (Mucilago cydonii—U. S. P.) is made by macerating two parts of quince seed for half an hour in one hundred parts of cold, distilled water and straining without pressure.

Diseases of the Eye.—The mucilage of quince seed was formerly much used, either alone or as an addition to sedative and astringent washes, in ACUTE CONJUNCTIVITIS. It is a soothing application, but has a disagreeable effect if allowed to dry upon the lashes, and should not be used in too large proportion. One or two drachms may be added to six ounces of water.

DERMATOL. Basic Gallate of Bismuth. Subgallate of Bismuth.

Dermatol is a trade name for a basic bismuth gallate. It forms a fine, yellow powder, without odor or hygroscopic properties. It contains fifty-five per cent. bismuth oxide. It is practically insoluble. It is employed pure as a powder, united with other desiccants, or exhibited in form of an ointment or collodion (1.5 : 10).

Dermatol is protectant, desiccant, and antiseptic.

General Surgery.—R. Glaeser (*Semaine Méd.*, 1891, No. 27) employs dermatol as a desiccant; while checking serous exudation it stimulates granulations. (*M. B.*, October, 1891.)

Doernberger (*Therap. Monatshefte*, February, 1892) uses dermatol in the form of an ointment in the treatment in the second degree of BURN. A. Bluhn (*ibid.*, December, 1891) treats CARBUNCLE after incision with advantage by applications of the dry powder.

Diseases of the Skin.—Dermatol is recommended by Rosenthal (*Monatsh. f. D. u. Syph.*, 1, 1891) as a substitute for iodoform, on account of its stability in air and light, its non-poisonous and its antiseptic qualities, its want of odor, and its drying and healing effect on WOUNDS. It has not, as yet, been employed extensively in dermatology, but is thought likely to prove useful in affections accompanied by profuse secretion, as SEVERE BURNS, MOIST ECZEMA, ULCERS, etc.

The following formulæ are suggested: Dermatol, ʒj; lanolin, ʒij; vaseline, ʒvj. M.—Dermatol, pulv. oxide of zinc, āā gr. l; vaseline, ℥j. M.—Dermatol, ℈j; pulv. oxide of zinc, amyl, āā ʒiiss; vaseline, ℥j.

Diseases of the Ear, Throat, etc.—Doernberger and Chaniavsky use dermatol pure or united with boric acid in OTORRHŒA. Dermatol is recommended by F. Bloebaum (*Deutsche Med. Zeit.*, January 1, 1892) as an excellent application to BURNS resulting from the use of the galvano-cautery in the pharynx.

DEXTRIN. Artificial Gum.

Dextrin is produced by the action of acids or diastase on starch. It is freely soluble in both hot and cold water, and forms an exceedingly adhesive, mucilaginous solution. It occurs in commerce in three forms, that of a concentrated solution, as a white powder, and in yellowish-white lumps somewhat resembling gum arabic.

General Surgery.—Dextrin is one of the substances used in the coating of Lister's protective. The "protective" consists of oiled silk coated with copal varnish; over the surface of which, when dry, a mixture of dextrin one part, starch two parts, and of cold aqueous solution of carbolic acid (1–20) sixteen parts, is applied. The object of the treatment is to render the oiled silk impervious to the carbolic acid (*q. v.*). By this means the carbolic acid is distributed evenly over the surface instead of being disposed in globules, as would otherwise be the case.

DUBOISIA.

A small tree (*Duboisia myoporoides*), a native of Australia. The leaves are medicinal. They contain the alkaloid duboisine, which is chemically identical with hyoscyamine, but physiologically is much stronger. (See *Belladonna.*) The sulphate is the salt most frequently used.

Diseases of the Eye.—Duboisine has recently come into quite general use as a mydriatic. Its physiological action on the iris and ciliary muscle is the same as that of atropine, except that it is more prompt and energetic and of shorter duration. The latter peculiarity recommends it particularly where it is desired to paralyze the accommodation for the estimation of refraction. A solution of two grains to the ounce of the sulphate or salicylate of duboisine paralyzes the accommodation as completely as a four-grain solution of atropine, and more quickly, while its effects last only about half as long as those of atropine. Recovery takes place in from five to seven days.

The objection to its use is its greater tendency to produce constitutional disturbance. Alarming symptoms have frequently been produced by the instillation of four-grain solutions and occasionally by the use of much weaker ones. It is exceptional, however, for unpleasant results to follow the use of a two-grain solution, and this proportion is quite sufficient to insure the full effect of the drug. This, used three times the day before and once on the day of the examination, may be relied upon to produce complete paralysis of accommodation for testing the refraction.

Duboisine is said to act well in some cases in which the irritating effect of atropine upon the conjunctiva precludes the use of the latter, but the greater danger of constitutional poisoning and the shorter duration of its effects upon the eye prevent it from competing with atropine as a therapeutic agent. Like the other mydriatics, it must be used with caution where there is suspicion of increased intraocular tension. Duboisine is generally considered to be identical with hyoscyamine. Wood, in the recent edition of his "Therapeutics," states that the most recent chemical researches seem to show that there are three mydriatic alkaloids—atropine, hyoscyamine, and hyoscine—daturine and duboisine being mixtures of these.

ERGOTA. Ergot of Rye.

"Ergot is the sclerotium of *Claviceps purpurea*, replacing the grain ot *Secale cereale.*" (U. S. P.) Ergot is not the altered grain of the rye, as is usually believed, but is a parasitic fungus growing in the rye head. It contains a large proportion of fixed oil (*oil of ergot*), which is procured by percolating the ergot, either with ether or benzin, and evaporating the solvent. Ergot contains *ecboline* and *ergotine*, which exist in it combined with ergotic acid. *Ergotinine*, a colorless, crystallized alkaloid, has also been separated, and *sclerotic acid*, or *sclerotinic acid*, has been separated by Dragendorff.

Other chemists have found *ergotic* acid, *sphacelic* acid, and the alkaloid *cornutine*. The question as to the value and identity of these principles is obscure. The article usually sold as *Ergotin* is not an alkaloid, but is a solid extract, and should be so designated. A *Solid Extract* of Ergot (of uncertain strength), a *Fluid Extract* (one cubic centimetre of which represents the activity of one gramme of ergot), and the *Wine of Ergot* (containing the activity of fifteen parts of ergot in one hundred of wine) are official.

General Surgery.—Ergot may be used with great advantage hypodermically (Squibb's fluid extract, ♏j to gr. j) in HEMORRHAGE FROM THE INTESTINE in typhoid fever. Ergotin, given hypodermically in five-grain doses, is occasionally of service in checking oozing after operations involving the hand and foot, where elevation and pressure have failed. Schünking (*Centralbl. f. Gynäkol.*, February 15, 1888) recommends the treatment of uterine fibroids with injections, with an absolutely clean hypodermic needle, of fresh, pure solutions of ergotin, into the central part of the anterior lip of the uterus; the injection not to go deeper than one-fourth of an inch, and care being taken not to insert the needle into the tumor or the body of the uterus. Ergot is extremely useful in POST-PARTUM HEMORRHAGES, arresting the bleeding by producing firm contraction of the uterus, and by its influence on the blood-vessels. It is the most valuable of remedies in uterine hemorrhage, checking the bleeding when other remedies have failed. In these conditions ergot is usually given by the mouth in full doses. Where a very prompt and decided action is demanded, either ergotin or the fluid extract may be given hypodermically. Eldridge and others advise the use of ergot by injection in the treatment of GONORRHŒA. Fluid ext. ergot, one part; water, five parts. In rare cases the use of ergot, by this means, may be productive of good results, but as a rule the injection of lead and zinc will prove a more satisfactory means of dealing with this affection.

In PROLAPSUS OF THE RECTUM, D. H. Agnew and Langenbeck advise, before resorting to more radical measures, the hypodermic use of the concentrated fluid extract of ergot, introduced into the submucous tissues of the rectum, the dose being about five to seven grains of the drug, or its equivalent; the injections to be repeated every second day for two weeks.

Langenbeck advises a similar method of treatment in cases of HEMORRHOIDS, injecting ergotin beneath the rectal mucous membrane. This mode of treatment is based on the property possessed by the drug of exciting contraction of the muscular walls of the blood-vessels. Langenbeck also carried out the same idea in the treatment of ANEURISM, by injecting into the subcutaneous tissues external to the sac a concentrated preparation of ergotin, with the hope of producing muscular contraction of the walls. He cites a case in which an old aneurism of the radial artery was cured in eight days. Most probably the success attained was due rather to an inflammatory condition occasioned by the drug in the cellular tissues than to its physiological action on the muscular fibres of the sac. In such a treatment from seven to ten drops of Squibb's fluid extract may be used not oftener than once in two or three days, under the most favorable circumstances. We have used ergot in suppository, in cases of Enlargement of the Prostate Gland, but for the most part with negative results.

Diseases of the Skin.—Ergot has been recommended in the local treatment of Epithelioma. The drug, reduced to an impalpable powder, is dusted on in a thick layer thrice daily, and is followed by the application of a rag moistened with the following lotion: ℞. Acidi carbolici, fʒj; acidi sulphurosi, glycerini, āā f℥j; aquæ ad f℥iv. The rationale of the action of ergot in this case does not appear. Bulkley recommends this drug in Carbuncle in the following combination: ℞. Ext. ergotæ, ʒij; pulv. zinci oxidi, ʒss; ung. aq. rosæ, ℥ij. M.

Diseases of the Nose and Throat.—T. A. De Blois (*Arch. Laryngology*, 1883, vol. IV, p. 22) recommends injections of ergotin in the submucous tissues of Nasal Hypertrophies.

W. C. Dabney (*Am. Journ. Med. Sci.*, July, 1879) employs ergot in the following combination for Pharyngitis: Ext. of ergot (Squibb's), gr. xx; tincture of iodine, fʒj; glycerin, f℥j.

In the use of ergot in the form of a lozenge, each mass may contain five grains of the drug.

ERYTHROPHLEINE.

Erythrophleine is an alkaloid extracted from *Erythrophleum guineense* (sassy bark, an African ordeal poison). The hydrochloride of erythrophleine occurs in the form of yellowish-white crystals, and is soluble in water.

Diseases of the Eye.—Erythrophleine is described by Lewin, of Berlin (*Therapeutic Gazette*, March 15, 1888), as a powerful local anæsthetic whose effects upon the eye are insensibility of the cornea and conjunctiva and contraction of the pupil. He used a solution of the hydrochloride of from .05 to .25 per cent. in experiments upon cats, dogs, rabbits, and guinea-pigs, and states that its action began in fifteen or twenty minutes and lasted for several hours,—in some cases, indeed, for two days. He found that three drops of a solution containing one and a half grains to 2000 drops of water would produce anæsthesia. He concludes that "Erythrophleine is, however, a poison, and, apart from its truly wonderful anæsthetic properties, it also influences the heart, and therefore caution is necessary." Tweedy (London *Lancet*, 1888, pp. 249 and 346) experimented with the hydrochloride on the human eye and failed to produce any decided anæsthesia. Solutions of .25 and .50 per cent. caused some pain and irritation, with ciliary injection and *dilatation* of the pupil. He also noted blurred vision and a circular colored halo around an artificial light due to disturbance of corneal epithelium.

Other observers have confirmed Lewin's conclusions in whole or in part, while still others have denied them. The fact probably is that the drug has not yet been definitely isolated, and that the preparations used by different experimenters have not been identical. There is a pretty general admission of its irritating effects when applied to the eye. Its present status is, albeit, that of a very uncertain remedy, and it has no standing as a competitor of cocaine.

ERYTHROXYLON. Coca.

Erythroxylon is the name given to "the leaves of *Erythroxylon Coca*." (U. S. P.) It owes its activity to the presence of cocaine (*q. v.*). The fluid extract is official, and one cubic centimetre of it represents the activity of one gramme of coca leaves.

Coca possesses in a mild form the properties of cocaina. The alkaloid has almost entirely superseded the crude drug.

Diseases of the Throat, etc.—The concentrated infusion of coca leaves is recommended by J. Solis-Cohen (*N. Y. Med. Journ.*, 1886) as a substitute for cocaine in gargles and sprays. The fluid extract is also useful for relieving TURGESCENCE OF THE NASAL MUCOUS MEMBRANE. Nachtigall recommends the use of cigarettes made from the leaves for ASTHMA.

A lozenge containing two grains of the leaves can be procured.

ETHYL BROMIDE. Bromide of Ethyl. Hydrobromic Ether.

"A colorless, very volatile liquid, not inflammable, having an agreeable odor and a pungent, saccharine taste." (U. S. D.) It boils at 104° F. It is made, after several precautions have been observed, by the action of bromine on alcohol in the presence of phosphorus. It liberates free bromine when long kept.

Bromide of ethyl is anæsthetic. It should be used with caution.

General Surgery.—An effort was made to introduce it as a substitute for ether by the late R. J. Levis, who claimed that it possessed all the advantages of chloroform without any of its dangerous properties. For about six months it was employed in his wards at the Pennsylvania Hospital, but, after a fair trial, it was found not as safe or reliable as ether, death sometimes following its employment. Its mode of action is quite similar to that of chloroform. Its administration should never be preceded or followed by that of chloroform.* As a local anæsthetic bromide of ethyl has been used in the form of a spray.

Diseases of the Ear, Nose, and Throat.—E. L. Shurly (*N. Y. Med. Jour.*, September 11, 1886) believes that ethyl bromide should be placed in the group of inhalants for the relief of COUGH. It is not quite so efficacious as chloroform, but causes less general anæsthesia. S. Hartwell Chapman recommends bromide of ethyl as an analgesic. Mixed with glycerin, it may be used in the outer-ear passage in OTALGIA. (H. McNaughton Jones.)

ETHYL IODIDE. Iodide of Ethyl. Hydriodic Ether.

Ethyl iodide is prepared by distilling a mixture of five parts of absolute alcohol, ten parts of iodine, and one of phosphorus. Care must be observed in mixing these ingredients, and the iodine should be added last, in small quantities at a time. It is a colorless liquid (though it is apt to become colored by the liberation of iodine), has a penetrating, ethereal odor, is not inflammable, is dissolved by alcohol and ether, but is only sparingly soluble in water. It boils at 158° to 160° F.

The vapor acts as a powerful antispasmodic, and exerts upon the economy the impression of iodine. It is recommended to place a capsule in the handkerchief, crush it, inhale the vapor, and repeat in ten minutes, or thrice daily. After the patient acquires confidence, inhalations can be made directly from a small vial. It is without depressant or toxic effect.

Diseases of the Ear, Nose, and Throat.—The vapor of hydriodic ether is recommended by H. McNaughton Jones in the treatment of CATARRHAL DEAFNESS. It is of value where the impression of iodine is indicated in morbid states of the bronchi and lungs, and appears to be of especial use in ASTHMA. It tends to the absorption of lymphatic exudations and indirectly aids in diminishing cough dependent upon irritative excess of secretion. Ten to fifteen drops may be inhaled several times a day. S. Solis Cohen (*N. Y. Med. Jour.*, March 6, 1886) recommends ten minims or more on a sponge, for inhalation, in SYPHILITIC CORYZA, LARYNGEAL PHTHISIS, and in allied pharyngeal affections. A writer in *L'Union Médicale* (January 10, 1891) recommends that ten drops of the iodide of ethyl be inhaled from a handkerchief in HAY FEVER.

Iodide of ethyl is also employed in ASTHMATIC SEIZURES or the DYSP-

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* The claims of bromide of ethyl have been examined lately with more favorable results than above stated. E. E. Montgomery (*Therap. Gaz.*, June 15, 1892) claims to have administered it in nearly five hundred cases with satisfaction.. Five per cent. only of these cases exhibited nausea and vomiting in a marked degree. An unpleasant result of its use is the exceedingly disagreeable garlic-like odor on the breath of the patient, for forty-eight hours after administration. See also articles in *Therap. Monatshf.*, 1888, and *Pittsburg Med. Rev.*, 1889.

NŒA OF PHTHISIS, and, according to Seè, is prompt and satisfactory in its action. In CHRONIC BRONCHITIS inhalations have proved of service in the hands of R. M. Lawrence* (*N. Y. Med. Rec.*, June, 1880, 685) by increasing secretion and allaying spasm. According to the observations of this writer, the drug is incapable of producing anæsthesia upon man. In his own person it failed to produce drowsiness after half an hour's trial.

EUCALYPTUS.

The preparations of eucalyptus referred to in this book are as follows: Oil of Eucalyptus, Eucalyptol, resin of Eucalyptus, and the Fluid Extract of Eucalyptus. Since the medicinal properties of these preparations are much the same, they will not be treated separately.

OIL OF EUCALYPTUS.

"The volatile oil is distilled from the fresh leaves of *Eucalyptus globulus* and other species of *Eucalyptus*." (U. S. P.) It is a "colorless, or a very pale, yellowish liquid, having a characteristic aromatic odor and a pungent, spicy, and cooling taste. It is soluble in an equal weight of alcohol." (U. S. P.)

EUCALYPTOL.

Eucalyptol is not identical with oil of eucalyptus, as is generally believed, but is an oxygenated constituent of that oil. It is separated from the oil by fractional distillation, the portion coming over between 170° and 178° C. constitutes eucalyptol. It is purified by redistillation from caustic potash or chloride of calcium, and then boils at 176° to 177° C. It is colorless, slightly soluble in water, and very freely soluble in alcohol, and diffuses through paraffin. It arrests amœboid movement of the white corpuscles.

Eucalyptus is an antiseptic, possessing the valuable property of rarely if ever inducing toxic impression. It is well to remember, however, the case of Dr. Owen (*Australian Med. Jour.*, September 15, 1885), in which a child, seventeen months old, was poisoned by swallowing a few drops of the fluid extract. Eucalyptus is antiseptic, sedative, detergent, and probably astringent. Ringer claims that its antiseptic properties increase with age.

RESIN OF EUCALYPTUS.

Dammar has been used in place of the resin of eucalyptus with much more satisfactory results, and seems to be fairly trustworthy as an antiseptic.

General Surgery.—Oil of eucalyptus is used as an antiseptic in surgery in the treatment of wounds and ulcers in conditions similar to those where carbolic acid is indicated. It has been urged by Dr. Schultz, of Bonn (*Centralbl. für Chirurgie*, January 24, 1880), that its antiseptic properties are three times as great as those of carbolic acid—carbolic acid preventing putrefaction when present in the proportion of one to 200 parts, the oil of eucalyptus accomplishing the same effect when present in one to 666 parts. Bing has found that it hinders the passage of white blood-corpuscles out of the vessels; therefore, on Cohnheim's theory, it is capable of arresting SUPPURATION. It has been substituted by Lister for carbolic acid in making gauze, but, owing to its volatile nature, it keeps badly if exposed to the air.

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* The article by Lawrence is the best monographic account of this drug.

Oil of eucalyptus can be used on the scrotum, or in patients who are especially susceptible to carbolic acid or corrosive sublimate. It has been employed as an ointment, with cosmoline or lard, in the strength of ʒss to ℥j, and this may be used as are salicylic or boric acid ointments. The ointment may be especially useful in the treatment of BURNS, as it tends to sterilize the discharge.

In CANCER, accompanied with much odor and foul discharge, the oil of eucalyptus has been used with success. IN ULCERATED CANCER OF THE BREAST an ointment composed of iodoform, one drachm; oil of eucalyptus, one ounce; vaseline and paraffin, of each one ounce, spread on lint, will be found a satisfactory dressing. A tampon of cotton saturated with a solution of glycerin and oil of eucalyptus is serviceable in UTERINE CANCER.

Diseases of the Nose, Throat, etc.—As an agent controlling inflammation of mucous surfaces it is placed by W. B. Ketchum (*Therapeutic Gazette*, 1886) above that of nitrate of silver and iodine. It is recommended that the fluid extract be diluted with an equal quantity of glycerin and painted upon the affected parts. In this connection it has received high encomiums in the local treatment of TONSILLITIS and PHARYNGEAL DIPHTHERIA (Brondel, *Gaz. des Hopitaux*, December 11, 1886), as well as in the ANGINA OF SCARLET FEVER. C. N. Palmer employs the pure fluid extract on DIPHTHERITIC PATCHES. APHTHOUS SORES, as well as those of CANCRUM ORIS, are also relieved by the same application. For the condition last named ten drops may be added to a half tumbler of water.

As a spray in the pharynx and mouth, where a disinfectant effect is to be combined with one which is soothing and antiseptic, Hardwicke recommends the following: Oil of eucalyptus, one drachm; terebene, two drachms; alcohol, one and a half ounces. In the opinion of W. E. Casselberry one-fourth per cent. to one per cent. of the oil suffices for use in the nasal chambers. Lint dipped in eucalyptol has proved to be an admirable application to TUBERCULAR ULCERATION OF THE TONGUE. A little over a fortnight sufficed to secure cicatrization. (Poncet, *Lyon Médical*, January, 1887.) M. Mackenzie employs one part of eucalyptus to two of starch as a powder in PHARYNGITIS SICCA. As an inhalant in DIPHTHERIA and PULMONARY GANGRENE and WHOOPING COUGH, Bonamy (*Bull. Therapeutique*, vol. 1, 1887) employs eucalyptus, as follows: Sixty grammes of eucalyptus leaves added to a litre of boiling water. The atmosphere of the room is completely saturated. The oil of eucalyptus is preferred by A. S. Houghton. (*Jour. Am. Med. Ass'n*, November 7, 1885). This writer combines a drachm of the oil with an ounce of liquid cosmoline. Lennox Brown recommends the following inhalant: Oil of eucalyptus, one to three drachms; magnesium carbonate (light), thirty to ninety grains; water, three ounces. Eucalyptus is recommended by W. D. Miller as an antiseptic to arrest DENTAL CARIES.

In the form of a lozenge eucalyptus is prescribed. Each lozenge contains from one to three grains of the extract, or one-eighth of a minim of the oil.

EUROPHEN.* Iodo-di-iso-butyl-ortho-cresol.

Europhen is obtained by the action of iso-butyl-ortho-cresol in alkaline solution in iodine. It is a fine, yellow powder, of an aromatic, saffron-like odor, insoluble in water and in glycerin, readily soluble in alcohol, in ether, in chloroform, and in oil, containing 28.1 per cent. of iodine. It is permanent in the dry state, but when heated with water to 70° C. (158° F.), or when left in contact with moisture at ordinary temperature, it gives off free iodine. One part of europhen will cover as much surface as will five parts of iodoform." (M. B., September, 1891.) It should be kept from the light, in a dry place. It is used ordinarily in the form of a powder or an ointment.

Europhen is protectant and alterant. It possesses many of the properties of iodine, while free from odor and poisonous properties.

General Surgery.—Europhen can be used in proportion of three parts of the powder to seven of olive oil as an excipient dressing for BURNS.

Diseases of the Skin.—As a substitute for iodoform, europhen has been used as an application in ULCERS, particularly VENEREAL and SYPHILITIC LESIONS, CONDYLOMATA, SCROFULODERMA, LUPUS, and DERMATITIS CALORICA, with success. Eichoff, who has studied its clinical employment, says that it is without effect in eczema, psoriasis, and favus. (*Therap. Monatshefte*, No. 7, 1891). Europhen seems to have a peculiarly destructive effect upon the *Staphylococcus pyogenes aureus.* (Siebel.)

Diseases of the Nose and Throat.—Europhen, used by insufflation, is recommended in NASAL CATARRH of children. It appears to be useful in reducing the hypersecretion following surgical procedures within the nasal chambers. According to Loewenstein (*Therap. Monatsh.*, September, 1891) europhen has value in EPISTAXIS due to erosion of the nasal septum. S. Johnston recommends the drug as an insufflation to the surfaces of SYPHILITIC ULCERS of the nasal passages.

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* Not to be confounded with Europhin (Phenyl-Ethylic-Urethane) (M. B., January, 1891).

FERRI CHLORIDUM. Chloride of Iron. Ferric Chloride. Perchloride of Iron. Sesquichloride of Iron.

Chloride of iron occurs in masses yellowish-orange in color and of crystalline structure. It is deliquescent, very soluble in water, and soluble also in alcohol and ether. Its reaction is acid. A solution of chloride of iron containing thirty-seven and eight-tenths per cent. of the anhydrous salt is official, as is also the familiar Tincture of the Chloride of Iron, which is now made by dissolving thirty-five parts of solution of chloride of iron in sufficient alcohol to make one hundred parts. A styptic cotton is prepared by steeping absorbent cotton in chloride of iron solution and drying.

Perchloride of iron is a powerful astringent and styptic. According to M. Delteau, it is the most powerful hæmostatic known.

General Surgery.—Chloride of iron has been used in the treatment of aneurism, nævi, varicose veins, etc. In ANEURISM, injections of the perchloride was first advised by Pravaz, of Lyons. According to his recommendation, twenty drops of a solution of the agent are to be injected slowly, by means of an ordinary hypodermic syringe, in an aneurism containing three or four ounces of blood. While coagulation is taking place (usually the work of about ten minutes), and for at least one hour afterward, the circulation through the sac must be arrested by pressure both above and below the tumor. If no inflammatory action is excited in the sac and pulsation still remains, the injection may be repeated in four or five days. Holmes states that out of eighteen cases in which this mode of treatment was pursued, four terminated fatally, the cause of death being gangrene of the sac and phlebitis. Such a method of treatment is inferior to compression or the use of the ligature, and should never be considered except when other means of controlling the circulation have failed. For the cure of NÆVUS, injections of the chloride solution have been effectual; and, when successful, it has the advantage of leaving only a slight scar. In the case of nævus as well as in aneurism, it is impossible to tell where the coagulum formed by the action of the iron salt on the blood may be swept by the blood current. Consequently the method is fraught with danger; and, except in special cases, it should always give way to safer means of treatment. In the case of VARICOSE VEINS in the extremities, the use of injections is to be deprecated. The solution of the chloride form has been used by Maupin and others in HOSPITAL GANGRENE with asserted good results; though, as a rule, bromine and nitric acid will be found more satisfactory. In the treatment of POST-PARTUM HEMORRHAGE, Barnes employed with success injections of the chloride in the strength of one part to three of water. It is gently thrown up to the fundus of the uterus from the nozzle of a Davidson or fountain syringe. Care should be taken to remove blood clots.* In the absence of a syringe a sponge saturated with the mixture tied to the end of a stick or piece of whalebone may be gently wiped around the inside of the uterus. Chloride of iron may also be used with great advantage to control HEMORRHAGE FROM UTERINE CANCER, UTERINE POLYPI, etc. Sometimes it is necessary to tampon the vagina with strips of lint previously soaked in a solution of the chloride. In doing this, it is well to saturate only the first two or three pieces, and for the remainder to use dry lint; otherwise, on removal a hard, unyielding mass will be found obstructing the vagina and often adherent to the vagina walls. One objection to the use of the chloride of iron as a topical application in uterine diseases is, that unless very much diluted it excoriates the mucous membrane of the vagina. To obviate this, Baum adds four grains of carbonate of sodium to the ounce of the chloride. Sodium chloride is formed, and according to Baum, the hæmostatic action of the iron is intensified rather than diminished by the neutralizing effect on the soda.

The tincture of the chloride of iron has been regarded by many as a specific for ERYSIPELAS; and this has led to its being used locally in the treatment of this affection by painting the surface of the skin over and around the inflamed area. We question, from our experience, if any benefit is to be derived from this mode of treatment, as its action appears to be entirely negative. If desired, it can readily be applied by means of a camel's hair brush or a small cotton swab.

For the removal of SEAT WORMS from the rectum, an enema containing a half drachm to a pint of water is very efficient. The tincture of the chloride of iron has been used with some success in the treatment of CYSTIC GOITRE, 10–20 m. being injected from a hypodermic syringe every three or four days. HEMORRHOIDAL TUMORS are often injected with a few drops of the tincture of the chloride of iron from a hypodermic syringe after the method of Mr. Colles. This mode of procedure is not applicable to all varieties of piles, and is best suited to small, single, pedunculated projections just beyond the verge of the anus.

Diseases of the Skin.—The chloride of iron is ordinarily employed in the form of tincture of the chloride (U. S. P.) for the destruction of WARTS (VERRUCÆ), particularly venereal warts or CONDYLOMATA.

In ONYCHIA the tincture brushed on several times a day is found of benefit.

The following formula has been highly recommended as an external application in Hyperidrosis of the feet:—℞. Ferri chloridi, ℥ss; glycerini, ℈iv; ol. bergamot., fʒiiss. It is a strong application and should be applied with caution. A mixture of equal parts of chloride of iron and opium is commended by Monin as an application for eradicating Corns.

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* The modern aseptic methods of arresting uterine hemorrhage are superior to those here commended. Nevertheless, in an emergency it is well to remember the efficacy of chloride of iron.

Diseases of the Ear, Nose, Throat, etc.—Chloride of iron is astringent, hæmostatic, and caustic. It is commonly used in solution. Concentrated solutions are alone caustic.

Various forms of styptic cotton or paper are in the market. Styptic paper is ordinarily made by mixing with the paper pulp, during the process or manufacture of the material, some solution of ferric chloride. A styptic collodion is prepared by adding one part of the crystal of chloride to six of collodion. The hæmostatic properties of chloride of iron are increased by the addition of a little table salt.

As a caustic, chloride of iron is of use in the destruction of aural polypus. B. Robinson (Nasal Catarrh, p. 165) recommends chloride of iron in treatment of naso-pharyngeal hypertrophies; G. T. Maxwell (*N. Y. Med. Record*, October 1, 1868) injects the fluid directly into the mass. As an astringent nasal plug one-half ounce of the tincture and ten minims of glycerin is used in saturating the cotton.

The tincture of chloride of iron is accepted by F. T. Kidder (*Med. and Surg. Reporter*, November 8, 1890) as the most useful of all the remedies for Tonsillitis. The author gives it with glycerin—two drachms of iron to two ounces of glycerin; a teaspoonful every two hours. This, doubtless, acts in great part locally; the medicine, being swallowed, has an advantageous effect on the entire economy, or the remedy may be applied directly to the tonsils by a brush.

It is also an admirable remedy in Chronic Laryngitis. In the strength of thirty to sixty grains to the ounce used with the brush by M. J. Asch (*Trans. American Laryngological Ass'n*, 1887) in hoarseness of professional singers. A single application will often put the parts in very good condition.

For general purposes, when an astringent application is needed to the pharynx and larynx, a strength of solution of tincture of iron one-half drachm to a drachm to the ounce of water will serve a useful purpose.

For Hæmoptysis a spray of five grains to the ounce of water may be ordered, or it may be used as a spray inhalant.

A lozenge containing the tincture of iron is prepared. Each lozenge exhibits one and a half minims of the agent.

Some writers recommend a local application of thirty grains to the ounce, with a little glycerin, to be used to the mucous membrane of the naso-pharynx in Chronic Inflammation. This is much stronger than need be. From three to five grains will suffice.

This agent has long been one of the remedies generally relied upon in the local treatment of DIPHTHERIA. Lunin, in 1882, found the best results following its use. A convenient form is to add one drachm of the tincture to two ounces of syrup. This can be given as an internal remedy, but the tenacious character of the mucus causes the remedy to cling to the walls of the pharynx and thus, pressing downward, secures a local application. W. Porter (*Trans. Amer. Laryngological Ass'n*, 1887) advocates a much stronger preparation—namely, equal parts of the tincture with glycerin. The application should be made every two or three hours.

Chloride of Iron Wool: Cotton-wool, one drachm; glycerin, ten minims; tr. fer. chlor., one ounce. Mix the glycerin with the tincture, saturate the wool with the liquid, and dry.

FERRI ET AMMONII SULPHAS. Sulphate of Iron and Ammonium. Ferric Alum.

It occurs in "pale violet, octahedral crystals, efflorescent on exposure to air, odorless, having styptic taste and a slightly acid reaction. Soluble in three parts of water at 15° C. (59° F.) and in eight-tenths part of boiling water; insoluble in alcohol." (U. S. P.) Sulphate of iron and potassium is also sold under the name of "ferric alum."

Ferric alum is a powerful astringent.

General Surgery.—Ferric alum often substitutes alum in practice, as it is more astringent. It is devoid of the stimulating effects of the iron salts. It is in requisition as a vaginal wash in the treatment of LEUCORRHŒA and VAGINITIS. A saturated hot solution may be employed as a hæmostatic.

Diseases of the Ear, Nose, and Throat.—Keene recommends a solution of eighty grains to the ounce for CHRONIC LARYNGITIS. In a solution of four grains to the ounce of water ferric alum is a useful astringent in CHRONIC NASAL CATARRH. It stains linen, and on this account is not so popular as are some other forms of astringents. In the strength of three grains to the ounce it may be used as a spray in PHARYNGITIS and LARYNGITIS.

FERRI SUBSULPHAS. Monsel's Salt. Basic Ferric Sulphate, $Fe_4O(SO_4)_5$.

It occurs in the form of "thin, transparent scales, is of a reddish-brown color, very deliquescent, and very soluble in water." (U. S. D.) There is official, in the United States Pharmacopœia, a "liquor ferri subsulphatis" which contains forty-three and seven-tenths per cent. of the salt. It is usually known as "Monsel's solution," from M. Monsel, who first called attention to its properties as a styptic, in 1852. A hæmostatic absorbent cotton is prepared by steeping absorbent cotton in solutions of subsulphate of iron forty-five per cent.

Monsel's salt is a powerful astringent, styptic, and caustic. To procure the escharotic effect, the powder must be used pure; its use in this relation is restricted to soft polyps of the ear and nose. Moderate amount of sloughing ensues after its use as a styptic, and a hard, resistant clot is formed with the blood upon the bleeding surface. In this way too free use of the powder is accompanied by distress, if not actual inflammation of adjacent parts, while the attempts to remove the mass may excite renewed hemorrhage.

General Surgery.—Monsel's solution is very similar in its action to the chloride of iron. It is easy of application and rapid in action, hence it holds a high place in popular esteem. Yet caution is needed in employing it. In the application of Monsel's solution to a bleeding point, it is important that the smallest quantity possible should be introduced into the wound. It is best that a small pledget of lint or cotton be introduced directly into the bleeding spot and retained in position for some time. When a large quantity of the solution is poured into a bleeding wound it is likely to form a hard, disagreeable crust or coating of coagulated blood over the entire surface, and bleeding may go on concealed by this mass for a long time. In obstinate HEMORRHAGE FROM THE UTERUS, where other measures have failed, the vagina may be tamponed with pieces of lint saturated with the Monsel's solution (using the precaution described in speaking of chloride of iron) or a sponge may be saturated and held in contact with the bleeding point. Cotton in which the dry Monsel's salt has been thoroughly incorporated may be substituted for the solution.

Diseases of the Skin.—In dermatology the use of Monsel's solution, except occasionally in the treatment of INDOLENT ULCERS, is as an application in ONYCHIA. The following formula, suggested by Bulkley, is useful in ONYCHIA and PARONYCHIA:—℞. Liq. ferri subsulphatis, f℥j; ung. aquæ rosæ, ℥j. M.

Diseases of the Nose, Throat, etc.—In arresting bleeding from the tonsil instances have been known of the hard clots disengaging themselves from the side of the throat and falling into the larynx, causing fatal asphyxia. (Gross's "System of Surgery," II, 551.) Hence the powder should be used with discrimination and no more employed than is absolutely required to control the bleeding points.

Four grains of the salt to the ounce of water has been employed as a nasal wash in CHRONIC CATARRH. One part to three have been used to form a powder to be used in CHRONIC PHARYNGITIS. This powder is recommended by M. Mackenzie as an insufflation in CANCER OF THE ŒSOPHAGUS. Under its influence the growth is powerfully constringed and the lumen of the œsophagus temporarily widened—thus directly assisting the physician in introducing food into the stomach. Sixty grains to the ounce have been employed in HEMORRHAGE FROM THE VOCAL CORDS.

The properties of the subsulphate of iron are available in the form of the liquid ferri subsulphatis (Monsel's solution). Powerful astringent or styptic effects in the larynx are perhaps more easily controlled by the powder than the liquid—though much must be left to the judgment of the physician.

FERRI SULPHAS. Sulphate of Iron. Green Vitriol. Copperas.

" Large, pale, bluish-green, monoclinic prisms, efflorescent and absorbing oxygen on exposure to the air, without odor, having a saline, styptic taste and an acid reaction. Soluble in one and eight-tenths parts of water at 15° C. (59° F.) and in three-tenths parts of boiling water; insoluble in alcohol. It fuses when quickly heated. When slowly heated to 115° C. (239° F.) it falls to powder and loses thirty-eight and eighty-six hundredths per cent. of its weight." (U. S. P.) Copperas is impure or commercial sulphate of iron.

Sulphate of iron is astringent. It is irritating and should be used with caution on mucous surfaces.

General Surgery.—The impure sulphate of iron is an important disinfectant, although, according to recent experiments, it is not germicidal. To obtain the most prompt action, the iron should be used in solution or dusted in fine powder.

In the treatment of RECTAL HEMORRHAGE, where the parts are inflamed, an injection composed of two grains of sulphate of iron to the ounce of water, used daily, will be found of service. Moullin advises an ointment of the sulphate of iron, half drachm to one ounce, alone or combined with the ointment of hyoscyamus or opium. An injection of the sulphate (two grains to the fluidounce) may be used daily for a week or more in treating PROLAPSE OF THE RECTUM. In ERYSIPELAS, Velpeau employed the sulphate of iron (an ounce to a pint of water) as an external application, in forty cases. In every case the active symptoms were controlled in from twenty-four to forty-eight hours. It must not be forgotten that the eruption in one spot is usually limited to four days, and that curative topical agents are lauded from a lack of knowledge of the natural history of the affection. With regard to applications in erysipelas, it is a good rule, as pointed out by Reynolds, to avoid anything which shall expose the skin to varying temperatures, or which shall interrupt its functions.

Sulphate of iron has long been used in the treatment of CHANCRES and other VENEREAL SORES, by dusting them with finely-powdered salt, and then enveloping them in linen. This is a favorite treatment with sailors. The healing process progresses rapidly.

Diseases of the Ear, Nose, and Throat.—In the form of an ointment, in the strength of twenty grains to the ounce, this agent is valuable in the last stage of ERYSIPELAS of the auricle. A weaker preparation —viz., two grains to the ounce—is used by Sexton in CHRONIC ECZEMA of the auricle. In the proportion of one part to twenty, sulphate of iron may be used as a powder in the treatment of CHRONIC CORYZA and OZÆNA. In the strength of one-eighth of a grain to two grains to the ounce it is used as a spray to the larynx in CHRONIC LARYNGITIS accompanied by hypersecretion. Much more powerful solutions are named—as, for example, a half drachm to a drachm to the ounce—but their effects should be carefully observed, and no indications are available for such uses.

FLUORESCEIN. Resorcin-phtalein.

Fluorescein is one of the numerous coal-tar compounds. It is prepared by heating to 200° C. for a few minutes, equal weights of resorcin and phthalic anhydride, and adding the product to water. The resulting solution has an intense yellowish-green fluorescence. Fluorescein occurs in dark brown crystals, which forms with ammonia a red solution with a green fluorescence. It is not very soluble in water or alcohol.

Diseases of the Eye.—The use of fluorescein has recently been introduced as a guide to the application of the actual cautery in SLOUGHING KERATITIS. It marks out the precise area requiring cauterization, by giving a greenish tint to the portions of the cornea deprived of epithelium. "The finest divisions radiating from the ulcer into the clear cornea are by means of fluorescein exhibited to the naked eye with a distinctness formerly to be attained only by means of a lens or corneal microscope. Thus the lateral spreading, and also the depth of the ulcer, are clearly shown, the green tint of the floor of the ulcer standing out sharply against the yellow pus on the posterior layers of the cornea and in the anterior chamber." (*Oph. Review*, August, 1891, p. 240.)

Two per cent. of fluorescein can be dissolved in a three and a half per cent. solution of carbonate of soda.

FRAXINUS. Ash.

Many species of Fraxinus have been used. *Fraxinus excelsior* and *Fraxinus americana*, which are respectively the systemic names for the European and the American ash, are the principal medicinal forms. The bitter principle, "fraxin" or "paviin," has been extracted from the European varieties. The leaves have been used as antidote to snake bite.

An unofficial ointment of fraxinus is recommended by Michel (Cologne) as an embrocation to the ULCERS left after cautery treatment of the pharynx.

FUCHSIN. Fuchsine.

"Fuchsin is one of the older coal-tar products, having a complex base. It occurs in the form of large crystals of greenish lustre, which dissolve in water, with a carmine-red color." (U. S. D.) Commercial fuchsin, according to Elliot (*Jour. Cutaneous and Gen. Urin. Dis.*, July, 1892), contains arsenic. The article used for local medication must be chemically pure.

Diseases of the Skin.—Elliot (*l. c.*) recommends fuchsin in the form of an ointment (grains, five to the ounce) for PAGET'S DISEASE OF THE NIPPLE.

Diseases of the Throat, etc.—A saturated solution of fuchsin, in combination with a 1–1000 solution of corrosive sublimate, is recommended by K. Bogroff (*Vratch*, April 18, 1891) as a local application in MYCOSIS OF THE TONSIL. A two per cent. solution is employed as a spray in PHARYNGITIS associated with phthisis.

GALANGAL. China root. India Root. Galanga.

There are two varieties described—"galanga major" and "galanga minor." The first is derived from *Maranta galanga*, the second from *Alpinia officinarum*. Each contains a volatile oil and a resin, both of which are soluble in alcohol. The drug, however, is usually employed either in substance or in infusion.

Diseases of the Nose.—Galanga is a stimulant. It is used to excite sluggish states of the circulation and to encourage secretion of mucous glands. In the treatment of NASAL ATROPHIC CATARRH and PHARYNGITIS SICCA it enters into the composition of a powder in the proportion of equal parts of the powdered root and acacia or of starch.

GELATINA. Gelatin.

Gelatin is extracted from various animal substances by treating them with boiling water and then straining and evaporating the solution. The common forms of gelatin constitute glue, and the more carefully prepared, from better selected material, the various forms of medicinal gelatin. It is soluble in hot water, with which it forms the familiar jelly on cooling; it is also soluble in hot glycerin. It is insoluble in cold water and in alcohol.

All substances containing tannic acid are contraindicated in prescribing gelatin.

Gelatin is employed in making the ordinary *court plaster* by brushing a solution of one part of gelatin, in twelve parts of water, over thin silk stretched on a frame, one side of which has been previously treated with an alcoholic solution of benzoin to make it waterproof. Glycerin is often added to the gelatin to prevent cracking.

General Surgery.—Gelatin capsules, which may be obtained of almost any size, may be used as a satisfactory substitute for cacao-butter in suppositories, either for rectal or vaginal medication. To hasten the effect, the medicated solution may be placed in the aqueous solution or suspended in starch-water and then immediately introduced.

In making fixed dressings for surgical purposes, gelatin is employed in the same manner in which starch is. The addition of chalk to gelatin gives more solidity to the dressing, but on the whole it is inferior to plaster of Paris.

Diseases of the Skin.—Gelatin is employed in the treatment of skin diseases in baths (one pound dissolved in three quarts of boiling water to thirty gallons of water) or combined with glycerin as a jelly.

Glycerin jelly is made by boiling together one part of gelatin and three or four parts of glycerin until they form a translucent mass. Of this as much as may be called for is taken and dissolved by steaming. The medicinal ingredient, having in the meantime been finely rubbed up when requisite, with water or glycerin, is then added to the liquefied jelly and the resulting compound well shaken until it becomes a tenacious fluid, which may be moulded into tablets or poured into a vessel, the former mode of preparation being suitable for the soft and the latter for the hard jellies.

The jellies can be melted at a low temperature and painted on the skin with a brush. They form smooth, comfortable dressings, and may be found useful when ointments cannot be conveniently applied.

They are much employed by some dermatologists. We find them inconvenient of application excepting in a hospital, where all the necessary water-baths etc., can be easily obtained.

The exact proportions of the ingredients of the soft glycerinated jellies are five per cent. gelatin, 20 to 30 per cent. glycerin and 60 to 70 per cent. water. To these are added the medicinal agent in the proportions required, usually five to ten per cent.

The hard jellies contain ten per cent. gelatin, 40 to 80 per cent. glycerin, and 25 to 40 per cent. water. They are used by dropping a little boiling water on the surface of the cake of jelly and using a camel's-hair pencil to take up the rapidly drying solution and paint it on the affected parts.

Diseases of the Nose.—Gelatin is useful as a medium for carrying iodoform to the interior of the upper portion of the nasal chamber. For this purpose the preparation should be freshly made, and mixed in any desired quantity. Old preparations of gelatin are apt to become stiff and do not easily dissolve.

Gelatin forms the basis of NASAL BOUGIES. When combined with an equal quantity of glycerin and water, it is known as "gelato-glycerole." It can be medicated or made to assume, by the aid of moulds, a variety of forms. This agent can be carried to any part of the nose; it is of special value when retained in the space between the middle turbinated bone and the septum. It here slowly dissolves.

Menthol forms an efficient compound with gelatin for NASAL BOUGIES

(Rosenberg, *Berliner klin. Wochenschrift*, 1885, No. 48). It relieves nasal reflex neuroses.

S. Spicer (*Brit. Med. Jour.*, September 13, 1890) applies glyco-gelatin cylinders to hollow oval vulcanite plugs; they can be variously medicated.

GELSEMIUM. Gelsemium. Yellow Jasmine.

"The rhizome and rootlets of *Gelsemium sempervirens*." (U. S. P.) A fluid extract (one cubic centimetre of which represents one gramme of gelsemium) and a tincture (one hundred parts of which represents fifteen parts of gelsemium) are official.

Diseases of the Eye.—Gelsemium has been recommended for use in ophthalmic therapeutics as a MYDRIATIC. Tweedy (*Lancet*, 1877, vol. 1, p. 852) found that a solution of four grains of the hydrochloride to the ounce would produce maximum dilatation of the pupil in from fifty to seventy minutes, but that to ensure complete "paralysis of the accommodation within three hours, a solution of at least eight grains to the ounce must be used every fifteen minutes for the first hour, and every half hour afterward." He claims for it an advantage in refractive work in the fact that sufficient accommodation to enable the patient to read returns in from ten to fifteen hours, and that in thirty hours it is practically restored, although the pupil remains dilated for several days; but the time demanded by the slowness of its action is sufficient objection to its use in practice, and, as Wood suggests, such frequently repeated applications of a strong solution may not be without danger of poisoning by absorption. The introduction of homatropin has, at any rate, set aside any claims that it might have had.

In a number of cases, in which the external muscles were tested before and after its use, gelsemium was found to have had a depressing effect upon the external rectus. In one case recorded, this muscle, as tested by prisms, had lost half its power.

GERANIUM.* Geranium. Cranesbill.

"The rhizome of *Geranium maculatum*." (U. S. P.) A fluid extract (one cubic centimetre of which represents one gramme of geranium) is the only official preparation. The drug deteriorates on keeping, and is best when collected in April.

Geranium is astringent.

General Surgery.—A decoction is made by boiling an ounce of the drug to the pint of water, thus forming an astringent lotion, which is employed as a wash in LEUCORRHŒA. Its use is for the most part confined to domestic medicine.

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* Not to be confounded with rose geranium (*Pelargonium roseum*). Essence of rose geranium is one of the numerous agents which have been proposed to cover the odor of iodoform. Five minims of the essence may be added to each drachm of iodoform.

Diseases of the Nose, etc.—T. F. Rumboldt (*St. Louis Med. Archives*, 1873) finds the fluid extract of geranium, in the strength of one drachm to eight ounces of water, a valuable astringent in acute cases of NASO-PHARYNGEAL CATARRH, accompanied with excessive secretion. Whenever a mild impression is indicated, this drug will answer a useful purpose.

GLYCERINUM. Glycerin.

"A liquid obtained by the decomposition of fats or fixed oils and containing not less than ninety-five per cent. of absolute glycerin. A clear, colorless liquid, of syrupy consistence, oily to the touch, hygroscopic, without odor, very sweet and slightly warm to the taste, and neutral in reaction. It is soluble in all proportions in water and in alcohol, also in a mixture of three parts of alcohol and one part of ether, but insoluble in ether, chloroform, benzol, or fixed oils. Its specific gravity should not be less than 1.250." (U. S. P.) "It dissolves bromine, iodine, the iodide of sulphur, the chlorides of potassium and sodium, the fixed alkalies, and some of the alkaline earths, and a large number of neutral salts" (U. S. D.), as well as pepsin and the vegetable acids, creasote, carbolic acid, quinine, tannic acid, morphine, and nearly all substances which are in themselves soluble in water.

Glycerin is used in order to increase the specific gravity of fluids which are exceedingly diffused, such as tincture chloride of iron, etc. It is often mixed with carbolic acid, equal parts, and from this fifty per cent. mixture the various solutions of carbolic acid are made for disinfecting instruments, etc., the glycerin rendering the acid more readily dissolved in water than would otherwise be the case.

Glycerin is bland and unirritating as a rule, but in some subjects the drug will produce severe smarting, either of the skin or mucous membrane. When diluted, one to five, this objection no longer obtains. It must be remembered that the preparations of the shops may contain glucose, alkalies, lime, chlorine, etc.

The sweet taste of glycerin is conveniently covered by water or lemon juice.

Glycero-gelatin contains ten per cent. of gelatin, and solidifies on cooling.

Glycerin is protectant, antiseptic, and relieves œdematous congestion by abstracting moisture from the tissues.

General Surgery.—Glycerin is valuable as a preventive against BED-SORES. The part exposed to pressure should be washed twice daily with tepid water, carefully dried with a soft towel, and gently rubbed over with glycerin, or, if the skin be broken, glycerin-cream. A draw sheet made of linen, of sufficient width to admit of firmly tucking it into both sides of the bed, prevents the formation of folds or creases. It is important that this treatment should begin before the onset of redness or tenderness. In the treatment of COLD ABSCESS injections of iodoform and glycerin (1–10) after the manner of Billroth are satisfactory. After the cavity is evacuated the fluid is thrown through the cannula of the aspirator. The application is to be repeated as long as iodoform is found in the urine. (See *Iodoform.*) In contused and lacerated WOUNDS OF THE FACE, where a water dressing is employed and kept in contact by wet pieces of lint or linen, the addition of a drachm of glycerin to the ounce will assist in keeping the cloths moist. The agent is often employed in urethral injections in the treatment of GONORRHŒA. Ordinarily, it is medicated with subnitrate of bismuth or opium. Thus, ext. opii, ℈ij; glycerini, f℥j; aquæ rosæ, ℥iij. (Bumstead.)

Glycerin is employed in the manufacture of medicated pessaries and bougies used in the treatment of GLEET. In obstinate CONSTIPATION, glycerin added to warm soapsuds will often excite peristaltic action in the lower bowel when pure water will be ineffective. The employment of a glycerin suppository made with soap, is also commended. The suppository soon dissolves, leaving glycerin free in the rectum. A similar effect can be obtained by placing the agent in a capsule and inserting in the bowel. Glycerin may be injected, diluted with oil or water, equal parts, high up the rectum, by first gently inserting a soft catheter, eight to ten inches into the bowel, and attaching a small syringe. This is a successful means of dealing with the constipation following enteritis.

The use of the drug as a means of depletion was introduced into gynæcology by J. Marion Sims. A small tampon of cotton is saturated with glycerin and inserted in the vagina; a free watery discharge ensues, thereby relieving capillary engorgement and œdema. "An anæmic patient will gain strength from the constant presence of glycerin in the vagina, although the discharge excited by it may be greater than the previously existing leucorrhœa, and the fact can only be explained on the supposition that the glycerin arrests the escape of the more essential constituents of the blood. It has also the same power as hot water, although in a less degree, of exciting capillary contraction,.for any surface which has been long in contact with the glycerin will be found shriveled and blanched in appearance." (Emmet.) In cases of EROSION OF THE CERVIX or of ENDOMETRITIS, whether cervical or general, especially when connected with a condition of congestion or of subinvolution of the uterus, and in the tenderness due to congestion of the Fallopian tubes, ovaries, or broad ligaments, glycerin gives marked relief. The drug should always be of the best quality. The impure article used in the arts frequently causes a vaginitis as severe as that produced by gonorrhœa. To make the application a tampon of cotton, or, as Emmet prefers, of oakum, to which a string is attached, should be saturated with the agent and placed in the vagina against the cervix. The patient should be told to remove it in five or six hours when it becomes dry and irritating. As it is desirable that the woman should remain quiet during the depletion of the uterus and pelvic vessels, it is well to make the application in the evening, and to have the tampon removed in the morning. Glycerin and iodine are in common use in gynæcology, and are applicable in many phases of uterine disease.

Glycerin is a useful ingredient in lotions or ointments for the relief of PRURITUS ANI and ULCERATION OF THE RECTUM. It can be administered in various strengths.

Diseases of the Skin.—Glycerin is employed for softening crusts and masses of epithelial debris preparatory to local medical treatment of the underlying lesions, and also to give "body" to certain washes and lotions.

It should be mixed usually with a little water, especially when employed as a protective against CHAPPED HANDS or in fissures of the skin, as pure glycerin is at times irritating. Glycerin is sometimes employed as an emollient in BATHS, half a pint to a pint being added to thirty gallons of water.

Glycerin also enters into the composition of certain excellent toilet soaps, and combined with gelatin forms the basis of a number of applications. (See *Gelatin.*)

A glycerin ointment is made as follows: ℞. spermaceti, ℥ss; ceræ albæ, ʒj; olei amygdalæ, f℥ij; glycerini, f℥j. Melt the spermaceti and wax with the oil of almonds at a moderate heat; pour into a Wedgewood mortar and rub together until cold. This ointment is employed in DERMATITIS FROM COLD, CHAPPED HANDS, etc.

Diseases of the Ear, Nose, and Throat.—Glycerin is chiefly employed in lotions, mouth-washes, etc., to increase specific gravity, to favor exosmosis, and to diminish the irritable effects of certain drugs. It aids in retaining medicine in contact with the mucous membrane of the nose and throat for a longer time than when employed in a simple aqueous solution.

A preparation consisting of borax, gr. xl; glycerin, f℥j; water, f℥iv, will cure FISSURE OF THE TONGUE which has resisted other means of treatment. It may be employed in the strength of one part glycerin to four of water, with the addition of a little lemon juice, to relieve the glazed tongue in low types of disease; the mouth may be constantly swabbed out with it, adding greatly to the comfort of the patient. Glycerin will often cure THRUSH.

Its disposition to abstract moisture from the tissues renders it a valuable adjuvant in the treatment of NASAL HYPERTROPHIES if for any reason reduction by cauterization be undesired. A tampon soaked in a solution of glycerin, one part to four of water, is here of efficacy. The proportion of glycerin may be increased until it stands in equal amount with water. (C. F. McGahan, *Med. Times and Register,* November 9, 1889.) Glycerin softens collections of CERUMEN in the external auditory meatus. A few drops instilled before retiring renders the manipulation of extraction of the mass the following day a matter of easy performance. It is also of use in PRURITUS and NEURALGIA of the outer ear passage. It has been used pure in CHRONIC NASAL CATARRH.

Rauchfuss recommends it as a topical application in CHRONIC LARYNGITIS OF CHILDREN. In the proportion of one part to eight it is often used in gargles and lotions. Preparations which contain glycerin should be slightly warmed before being used in atomizer or inhaler, since the diminished density of the glycerin under moderate heat increases the ease with which the mass can be distributed.

A solution of glycerin in water, in the proportion of thirty-three per cent., is found a convenient one to use in many inhalants. Diluted glycerin slowly swallowed relieves the painful deglutition of CHRONIC LARYNGITIS.

Diseases of the Eye.—Glycerin is considerably used in ophthalmic surgery as an excipient, particularly in glycerole of tannin (*q. v.*); it also enters into the composition of boroglyceride (*q. v.*). These preparations are valuable applications in GRANULAR OPHTHALMIA and other forms of palpebral CONJUNCTIVITIS, and the hygroscopic action of the glycerin adds much to their efficiency, especially where the palpebral conjunctiva is œdematous. This same property unfits it for use, unless freely diluted in collyria, for acute general conjunctivitis.

GLYCERITES.

The *Glycerite of Starch*, *Glyceritum Amyli* (U. S. P.), is made by first rubbing and then heating together (below 144° C.—291° F.) one part of starch and nine parts of glycerin. It is an elegant vehicle for the application either of the contained glycerin or for the exhibition of other substances.

Glyceritum vitelli (glycerite of yolk of egg) is also official, and is made by rubbing together forty-five parts of the yolk of egg and fifty-five parts of glycerin. This is also known as "glyconin." In the British Pharmacopœia, glycerinum acidi carbolici, glycerinum acidi gallici, glycerinum acidi tannici, glycerinum boracis, are official, and are all made of the strength of one ounce by weight of the medicaments to four fluidounces of glycerin, and two fluidounces of water. Glycerinum aluminis (one ounce of alum and five fluidounces of glycerin), glycerinum plumbi subacetatis (a solution of subacetate of lead in glycerin, being of about the strength of the official liquor plumbi subacetatis (Goulard's Extract), and glycerinum tragacanthæ (one hundred and ten grains of tragacanth in a fluid ounce of glycerin) are also official in the Br. Ph.

Glycerite of yolk of egg applied to the skin, forms a varnish which effectually prevents the action of air. It is unalterable. This preparation has never been much used, but is likely to prove an agreeable substitute for greasy protective applications in ERYSIPELAS, FISSURED NIPPLES, etc. (See *Ovum.*)

General Surgery.—Glycerite of carbolic acid is a convenient preparation from which carbolized solutions can be made.

At one time at the Pennsylvania Hospital an attempt was made to substitute glycerite of starch, to which a small proportion of bichloride of mercury had been added, for zinc and boric ointment in the treatment of Superficial Abrasions and Ulcerations, with the hope that wounds could be more readily washed and cleaned. The dressing did not prove as satisfactory as had been hoped for. Glycerite of starch may be employed with advantage where a moist or wet dressing or a light poultice might be advisable, as in Superficial Burns or Erysipelatous Inflammations.

Diseases of the Skin.—Glycerite of Starch (sometimes called "plasma") is a valuable emollient in some cases of Acute Eczema, especially Eczema of the Scalp and Ears, and offers an admirable preliminary treatment in these cases.

The glycerite of starch is a good substitute for lard or cosmoline as a base for ointments. It does not easily become spoiled and keeps for a long time. It has been recommended to prevent pitting in Variola. The glycerite of carbolic acid is a useful application in Tinea Tonsurans.

The glycerite of tannin may sometimes be employed when an astringent application is required.

Recently H. von Hebra has brought forward a class of preparations which he calls "Saponated glycerin preparations." They will be found described under *soaps*.

French dermatologists combine one part of tartaric acid with twenty parts of the foregoing to form "glycerole tartarique," a soothing application in Eczema.

GLYCYRRHIZA. Liquorice Root. Licorice.

"The root of *Glycyrrhiza glabra*." (U. S. P.) Liquorice root contains a large proportion of a substance called Glycyrrhizin, which is very sparingly soluble in cold water and very freely soluble in boiling water, with which it forms a jelly as it cools. To this substance liquorice root owes its taste and flavoring properties.

Ammoniated Glycyrrhizin (official in the United States Pharmacopœia) is glycyrrhizin separated from liquorice root and combined with ammonia, and is in "dark brown or reddish-brown scales, inodorous, of a very sweet taste, and soluble in water and in alcohol." (U. S. P.)

Glycyrrhiza is often employed to dilute astringents when desired to use these agents in the form of powder.

It enters into the composition of a favorite lozenge in the proportion of from one to four grains of the extract to each mass.

GOSSYPIUM. Cotton.

Cotton is "the hair of the seed" of *Gossypium herbaceum* "and of other species of *Gossypium*." (U. S. P.) The cotton contemplated by the United States Pharmacopœia is "absorbent cotton" or cotton freed from the oil and other impurities; it is usually prepared by boiling with a solution of an alkaline soap, washing this out thoroughly, possibly washing again with a weak solution of caustic potash or soda, washing this out, pressing, and drying. When dried absorbent cotton is thrown upon water it should immediately absorb the latter and sink. From the seeds of the cotton plant a fixed oil is expressed, which is much employed for soap making and as an adulteration of and a substitute for olive oil. The oil also is official and enters into the composition of the ammonia, lime, camphor, and subacetate of lead liniments.

Cotton-seed oil is largely used, among other oils, as an adulterant to linseed oil. It is less innocent than any other agent so introduced, since it has a bad effect upon the skin.

Styptic cotton may be prepared by first passing the cotton through in a four per cent. solution of soda; then washing, drying, and subsequently dipping two or three times in a weak solution of the chloride of iron and again drying. It is then teased out with the fingers, leaving a brown, cottony mass, thoroughly impregnated with the salt of iron.

Under Gossypium will be treated the subjects: Raw Cotton; Absorbent Cotton; Gauze; and Paper.

RAW COTTON.

General Surgery.—Raw cotton is so familiar that description is unnecessary. Owing to the oil it contains, it will not absorb water, and consequently is practically useless for washing or cleansing wounds. It is employed chiefly as a padding for splints, and for protecting the extremities and cutaneous surfaces from contact with the air. Raw cotton, laid over the chest in layers two inches thick, forms a good chest dressing in PNEUMONIA. In the local treatment of ERYSIPELAS, one of the best methods is to keep the part wrapped in raw cotton; for the temperature of the part should be as nearly uniform as possible, and the cutaneous functions assisted. Painful and sensitive RHEUMATIC JOINTS in old people are often relieved by being wrapped in raw cotton, which is retained by means of a bandage. Cotton is often employed as a protective dressing for BURNS with advantage, if the burn is of the first or second degree; but it may irritate if in contact with a vesicated surface. Yet it at times forms one of the best dressings for BLISTERED SURFACES, laid evenly over the part and retained by the clothing or a bandage.

ABSORBENT COTTON.

General Surgery.—Absorbent cotton is now employed extensively in the washing and cleansing of wounds in the place of sponges. Small pledgets on an aluminium applicator are in use in gynæcology for carrying medicated applications within the uterine cavity. Washed cotton is always to be preferred where an aqueous solution is directed or for the absorption of bloody or serous discharges. It is inferior to raw cotton for the padding of splints, or for use as a protectant.

Absorbent cotton has been medicated in a variety of ways. Cotton prepared with corrosive sublimate is probably the most used, and forms an important factor in the antiseptic dressing of wounds. Borated, salicylated and iodoformized cotton may be substituted, according to the wishes of the surgeon. Styptic cotton is of service rolled into a small pledget and laid directly over a bleeding point, or a thin layer may be placed on the surface to aid the formation of a clot. It may be of service, also, in cases of bleeding from small wounds of the venous sinuses in operations on the brain. All medicated cottons, it is assumed, are free from septic material, and are always to be preferred for the making of tampons or the plugging of wounds. Laid over the gauze and retained by bandages, they constitute antiseptic dressings.

Diseases of the Ear and Nose.—The advantage formerly supposed to accrue from ARTIFICIAL EAR DRUMS can now be obtained by pledgets of cotton or a circular piece of lint adapted to the orifice. It would appear that this advantage is not to imitate a portion of the tympanic membrane, but to serve as a protectant to the mucous lining of the middle ear. Absorbent cotton in some forms of auditory discharge (especially those that occur in very young children) becomes clogged by tenacious muco-pus and acts as plugs to the meatus. It may, therefore, serve in a manner directly opposite that which is expected. When such disposition is noted it is necessary to anoint the conch with lard or cosmoline before using the cotton, or, what perhaps is better, discard it and substitute lamb's wool. Soft cotton thread can be medicated for application to the middle ear. Kirchner denominates "sublimate cord" a thread of cotton rendered absorbent and saturated in corrosive sublimate solution (*q. v.*). Hopmann, of Cologne (*Berlin Klin. Woch.*, No. 42, 1888), uses cotton tampons for the treatment of NASAL POLYPUS. Cotton tampons may be used conveniently in the nostril in the shape of absorbent lamp-wick. To be used in the nose they can be soaked in solutions of bichloride of mercury, 1–3000 or 1–5000.

Diseases of the Eye.—Absorbent cotton is very extensively used in ophthalmic surgery, and, in the interest of economy and cleanliness, has almost banished sponges and brushes. A little pledget twisted on the end of a probe or cotton holder or small stick answers all the purposes of a brush and can be thrown away when it has been once used. Cotton is also universally used for eye compresses and for the application of hot stupes.

It is a convenient means of applying dry heat in ophthalmic practice.

A mass as large as the fist, or even larger, heated by a stove or lamp or vessel of boiling water (frequently changed) can be used for the purpose.

On the whole, this form of applying dry heat is preferable to any other, and is of especial value in the relief of pain in INFLAMMATORY or NEURALGIC AFFECTIONS OF THE EYE and for the preservation of vitality in flaps that threaten to slough after plastic operations on the lids. For the former purpose the application is usually intermittent, lasting twenty minutes to a half an hour, and repeated several times a day; for the latter, it should be continuous, even during the night.

"Hot stupes" or "fomentations" are generally applied by means of small pads of cotton saturated with hot water and renewed every two or three minutes or oftener. The temperature of the water must be kept up either by gas or alcoholic flame or by the occasional addition of boiling water, and its degree may be generally determined by the sensations of the patient and should be as high as he can bear it without discomfort. The attendant should be cautioned not to blister the skin of the lids, as the patient may consider it necessary to bear the pain of the application, or his sensations may be blunted to it by the greater pain of the disease. Water at a temperature of 120° F. is usually easily borne, and some surgeons use it as high as 140°. The susceptibility of different individuals varies greatly, and tolerance is much increased by use.

Absorbent cotton is especially valuable for applying moist heat in ACUTE INFLAMMATION OF THE EYELIDS, with conjunctival discharge. The great advantage of the use of cotton is that the moment the mass of material is soaked with the infectious discharge it can be thrown away; hence the chances of infection are largely diminished.

In IRITIS hot stupes relieve pain, particularly in the rheumatic form, and promote absorption of inflammatory exudations. They may be used for twenty minutes or half an hour three or four times a day, or oftener if the relief is decided. In some cases dry heat may be more acceptable. The sensations of the patient are often the best guide as to which or whether either is to be used. Hot fomentations give more relief in HORDEOLUM and ABSCESS OF THE EYELIDS than any other remedy, and their frequent application is sometimes preferred to continuous poulticing in DACRYOCYSTITIS, but their greatest value is in the treatment of SLOUGHING KERATITIS, in which their use may be considered indispensable. In the latter instance a cotton compress is usually kept on the eye in the intervals of stuping, which may be repeated every two or three hours, and other remedies, such as atropine or eserine, the Sæmisch incision, or the actual cautery, will, of course, be resorted to according to the judgment of the surgeon. Frequent bathing with hot water allays the irritation of ACUTE CONJUNCTIVITIS, and some surgeons use hot stupes instead of cold applications in the severe forms of PURULENT OPHTHALMIA.

GAUZE.

General Surgery.—Gauze is usually a sheer material, known in the trade as cheese cloth, or tobacco cloth. Having a very open mesh, it absorbs well the materials with which it is impregnated, or the discharges from a wound when applied as a dressing. It can be easily obtained, is cheap, pliable, and forms a pleasant dressing when in contact with wounds. It is readily impregnated with various materials to render it antiseptic. Almost any variety of gauze may be obtained from dealers in surgical supplies. The most common and generally employed is the corrosive sublimate gauze, which is prepared by soaking clean cheese cloth, freed from all oily matter, in a solution of corrosive sublimate of the strength of 1–1000 for twenty-four hours. It is then cut into pieces the desired sizes and packed in closely-covered glass jars. If gauze has been long kept and exposed to the air, it is well to resoak it in a 1–2000 solution of corrosive sublimate before using. Corrosive sublimate gauze, when applied in contact with a wound and covered with wax paper or mackintosh, will sometimes irritate the skin. It should be anointed, therefore, with boric acid ointment or vaseline. In wound-treatment with corrosive sublimate gauze, two dressings are employed, the superficial and the deep, each usually composed of eight layers of the gauze. Often the deep dressing is applied moist and is much smaller than the superficial, which is preferably used dry.

Iodoform gauze is prepared by incorporating into the meshes of sterilized gauze powdered iodoform; it should then be carefully rolled up and packed in a glass jar. A mixture (5–50 per cent.) of iodoform and glycerin can be made, in which strips of gauze are immersed. This preparation is convenient for packing bone cavities, fistulous tracts, etc.

Carbolized gauze, the variety which was first introduced by Lister as a surgical dressing, is made by soaking clean gauze for a few hours in a mixture composed of: Resin, 1 pound; alcohol, 5 pints; castor oil, 24 ounces; carbolic acid, 12 ounces.

The excess is removed by passing the cloth through a clothes-wringer and then packing away for future use in glass jars.

The double cyanide of mercury and zinc gauze is more difficult to prepare than the other varieties, requiring the following: Potass. cyanide, 130 grains; mercuric cyanide, 251.7 grains; zinc sulph., 268.9 grains; hæmatoxylin, 1.3 grains; sol. ammonia, 6 minims; gauze (prepared, cleansed), 10 ounces; bichloride of mercury solution, 7.6 pints; distilled water, q. s. (*Br. Med. Jour.*, Nov. 9, 1889.

In charging gauze with this substance, 100 grains of the salt are dissolved in four pints of a 1–4000 bichloride solution, which will give from two to three per cent. of the cyanide to the dry gauze. It should be freshly prepared and used moist. The advantages claimed for it are that it is unirritating to the skin, and as the antiseptic is insoluble, it is not washed out by the wound discharges. Those who have employed it claim that it possesses decided advantages over the bichloride gauze. (Wharton, "Minor Surgery," p. 117.)

The best material for the collodion dressing is tarlatan.*

PAPER.

General Surgery.—Paper has been introduced into surgery as a substitute for lint, on account of its cheapness. Porous varieties resembling blotting paper, and capable of absorbing a large amount of fluids, have been manufactured; hence, it is suitable for applying wet dressings, as lead water and laudanum, etc. When once saturated, owing to its friable character, it cannot be reapplied. Waxed paper, made by immersing sheets of tissue paper in hot wax or paraffin, which, when cooled, forms a thin coating which makes it impervious to water, is universally employed as a substitute for oiled silk in hospital practice. Owing to its cheapness it can be discarded after each application. Because of its extreme thinness, it is advisable to use several layers, otherwise the moisture soon makes it way through.

Parchment paper has been introduced as a substitute for mackintosh in the Lister antiseptic gauze dressing. When first removed from the package, it is soft and pliable, but on drying becomes crisp. The paper, when applied over wet dressings to prevent the escape of moisture, appears to fulfill all purposes for which oil silk has served.

Diseases of the Skin.—Paraffin paper is employed as a dressing in some forms of skin disease accompanied by crusting and exfoliation, with the object in view of macerating the skin and thus loosening the products of disease. In other cases it is employed as a protectant. Paper is valuable in applying ointments and moist dressings. It is superior to rags and cloths. The paper is to be cut into pieces of the appropriate size, spread with the selected ointment and closely applied to the surface, being kept in place by a bandage. In affections of the fingers and toes, as well as the limbs generally, paraffin paper is easily adapted to the inequalities of the skin surfaces. The fact that it soon becomes friable and torn, is an advantage, as it ensures more frequent change of dressings, and consequent cleanliness.

Diseases of the Nose, etc.—Blotting paper rolled between the fingers and introduced into the nostrils is recommended by Sajous for removal of secretion from nasal passages in young children. It has been suggested also as a material for making tampons for arresting NASAL

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* A. Hewson ("The Use of Earth in Surgery," p. 19) strongly recommends a silken texture known in the trade as Donna Maria gauze. The strips should always be cut along the woof of the material, that is to say, lengthwise, and of the width usually employed with the resin or adhesive plaster.

HEMORRHAGE. Before soaking in a solution of nitrate of potash, paper should be cut in strips three inches long by half an inch broad. It is next dipped in the solution in a cylindrical vessel four inches high and two in diameter. The paper should then be ignited and the smoke inhaled by repeated deep inhalations. Nitrated papers, according to Lefferts, should be kept in tin foil or prepared in small quantities as required. (See *Potassii Nitras.*)

GRINDELIA.

"The leaves and flowering tops of *Grindelia robusta.*" (U. S. P.) Grindelia contains an essential oil somewhat resembling in odor the oil of turpentine, a resin, and some crystals with an alkaline reaction. The constituents of this plant have not been thoroughly investigated. The single official preparation is the fluid extract, one cubic centimetre of which is equivalent to one gramme of the drug.

Grindelia is a mild astringent and sedative.

General Surgery.—The surgeon may find this drug of service as a topical application in conjunction with other remedies, especially combined with creoline in the treatment of VAGINITIS, LEUCORRHŒA, and GONORRHŒA. The following mixture is recommended by Shoemaker: ℞. Ext. grindeliæ fld., half fluid ounce; creolini, two drachms; aquæ, q. s., ad. six fluidounces. As a urethral injection in GONORRHŒA and GLEET it will be well to begin with a solution about one-half the strength. Diluted with water or glycerin the fluid extract has been used with asserted advantage in the treatment of CHRONIC or INDOLENT ULCER, and may be applied by saturating lint and applying it as an ordinary water dressing, covered with waxed paper and retained by a bandage.

Diseases of the Skin.—The fluid extract is useful in the external treatment of inflammatory conditions of the skin. In DERMATITIS VENENATA or RHUS POISONING, in ACUTE ECZEMA, and in ERYSIPELAS, it is of great value, and ranks, in our opinion, with lead water in the class of cases for which the latter application is commonly employed. It is to be employed in a condition of considerable dilution; a lotion of half an ounce of the fluid extract to the pint of water is that which we have found generally useful. There are several preparations in the market of somewhat different appearance when diluted with water. We have not, however, observed any marked variation in their therapeutic effect. The lotion is commonly applied on cloths and allowed to evaporate. It should not be covered with an impermeable dressing.

Diseases of the Throat, etc.—W. P. Gibbons gives grindelia in the treatment of ASTHMA, but the impression is maintained by internal administration. It is probable, however, that some of the good effects described by him are due to a local action upon the nerve ends of the pharyngeal and laryngeal surfaces.

GUAIACI RESINA. Guaiac.

"The resin of the wood of *Guaiacum officinale*." (U. S. P.) The resin of guaiac comes in irregular vitreous masses of dark olive color, and possesses an acrid taste. It is readily pulverizable and yields a light, clear powder which becomes green upon exposure. It is very sparingly soluble in water, soluble in alcohol, ether, and alkaline solutions; it is also soluble in sulphuric acid. It consists of guaiaconic acid, guaiaretic acid, guaiac beta-resin, gum, coloring matter, etc. The Tincture of Guaiac (one hundred parts containing the activity of twenty parts of the resin), and the Ammoniated Tincture (made with aromatic spirit of ammonia as menstruum) of the same strength, are official.

Diseases of the Throat.—Guaiac has long had a high reputation in the treatment of FOLLICULAR TONSILLITIS and QUINSY. An addition of an astringent increases the efficacy of the drug, especially if it is essayed in the first stage of the disease. Used as a gargle the ammoniated tincture is the most palatable of the preparations. A teaspoonful of the tincture may be added to a half glassful of milk and used as a gargle every two or three hours. The exhibition of guaiac in the form of a lozenge has been long accepted by practitioners as desirable when the grade of inflammation is low. The following recipe from a Swedish formula is offered as a good example of a guaiacl ozenge: Pulverized resin of guaiac seven parts; sugar, seventeen parts; "cocoa paste," twenty-five parts. In the American market each lozenge may contain one and a half to two or three grains of the resin.

GUACO.

Guaco is a name given a product of various plants, obtained in Central America, South America, and the West Indies, belonging to the genera *Mikania* and *Aristolochia*. (U. S. D.)

Guaco is antipruritic.

Diseases of the Skin.—Butte (*Bull. de la Polycl. de Paris*, 1890; *Monatshefte f. Prakt Dermatol.*, Bd. XII, p. 188) has recommended the local employment of the watery extract of guaco as an antipruritic in PRURITUS and ECZEMA.

Its use is contraindicated in acute moist eczema, as it is irritating in this condition. The drug is also employed internally. Its effect is due to the paralyzing effect which the extract of the plant exerts upon sensory nerves. The following formula is recommended: ℞. Guaco, gr. xxx; sodii bicarbonat., gr. v; aquæ, gr. M. Boil for a quarter of an hour; then macerate for an hour and decant. This lotion is to be applied lukewarm as a wash or a compress may be wet with it.

The same drug is commended for internal uses in skin diseases, but this remedy has been introduced so recently that no corroborative experiments have been as yet published.

GURJUN. Gurjun Balsam. Wood Oil.

Gurjun balsam is an oleoresin which exudes from excavations in *Dipterocarpus turbinatus* and other species of *Dipterocarpus*. The tree is a native of East India.

The balsam is a thick, viscid liquid, of a reddish-brown color; soluble in chloroform, acetone, volatile oils, and carbon disulphide, and partly soluble in benzin, alcohol and ether. In many respects it resembles copaiba, to which it is often added as an adulteration. It contains volatile oil, gurjunic acid, a crystalline resin, and a bitter principle.

Diseases of the Skin.—Gurjun oil (*balsamum dipterocarpii*) is employed externally in the treatment of LEPROSY, being applied in the form of a mixture with an equal part of lime-water and thoroughly rubbed into the surface of the body, especially such parts as are affected. The inunction should be made daily for the space of one or two hours. The external application is usually accompanied by the internal administration of the same drug. (Dougal, "Report on the Treatment of Leprosy with Gurjun Oil," Calcutta, 1874. Quoted by Piffard.)

Gurjun oil has likewise been recommended by Wilson in CANCER (*Lancet*, vol. I, 1874, p. 694), in LUPUS (Lect. on Dermatology, vol. IV, London, 1875, p. 68), and in infiltrated ECZEMA and PSORIASIS by R. W. Taylor. It has not, however, come into general use in other diseases than leprosy.

GUTTA-PERCHA.

"The concrete exudation of *Isonandra gutta*." (U. S. P.) "Gutta percha is plastic above 60° C. (140° F.), very soft at the temperature of boiling water, insoluble in water or alcohol, soluble in chloroform, oil of turpentine, disulphide of carbon, benzin, or benzol." (U. S. D.)

LIQUOR GUTTA-PERCHÆ. Solution of Gutta-percha.*

This is a nine per cent. solution of gutta-percha in commercial chloroform. Ten per cent. of carbonate of lead is shaken with the solution, and after its subsidence the clear liquid is decanted. The carbonate of lead is added because it has the property of uniting with and carrying to the bottom the coloring matter. On account of the volatility of the chloroform and the viscidity of the solution it cannot be filtered, and the above addition is an easy and practical method of clarification.

General Surgery.—The solution of gutta-percha in chloroform (liquor gutta-perchæ) is sometimes useful as a protectant, and may be useful in retaining light dressings about the face.

Gutta-percha is used to a slight extent in making special splints, *e. g.*, for fracture of the inferior maxilla, and sometimes for the digits. Rubber is prepared for use in sheets, from which pieces the desired size may be cut and moulded into shape by placing in hot water. When properly moulded the splint should be plunged into cold water, where it immediately hardens and remains permanently in shape. Hard rubber is largely used in the manufacture of trusses, possessing advantage over the covered steel band (viz., that of cleanliness), while it can be worn in the bath.

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* In Germany this preparation goes by the name of "*traumaticin*."

When applied to the skin it forms a thin elastic film. It may be used in SMALL CUTS, CHAPPED HANDS and NIPPLES.

Diseases of the Skin.—Liquor gutta-perchæ has long been employed in this country as a protectant to the surface of the skin in slight abrasions or excoriations, and in FISSURES of the lips, nipples, tips of the fingers, etc. In case of FISSURED ECZEMA a light cauterization with nitrate of silver followed by the application of liquor gutta-perchæ often brings about a cure in a remarkably short space of time.

As a vehicle for the convenient local use of various medicaments liquor gutta-perchæ answers admirably, as in following formula: ℞. Ol. cadini, ʒj; liquor gutta-perchæ, ad f℥j. M. A camel's-hair brush is inserted in the cork for convenience of application. This pigment is an admirable dressing for some forms of ECZEMA. In INFANTILE ECZEMA RUBRUM it is very useful, particularly upon the cheeks, where it forms an antipruritic and impermeable dressing, which cannot be rubbed off, as ointments usually are, by the movements of the infant.

Chrysarobin offers a very convenient mode of treating PSORIASIS, though not so efficient as an ointment.

TINEA TONSURANS, if not too deep-seated, and especially TINEA CIRCINATA may be rapidly cured by this application. A good formula is: ℞. Chrysarobini, gr. l; liq. gutta-perchæ, f℥j. M. It makes a mixture or suspension. A coating of pure liquor gutta-perchæ may be painted over this application to protect the clothing.

As a vehicle liquor gutta-perchæ does not present any marked superiority to collodion, *q. v.* After using both we conclude that for all practical purposes they are equally useful.

"RUBBER PLASTER."*

General Surgery.—Rubber plaster is one of the most convenient forms of adhesive plaster for the field as well as the office. It is rolled on spools of various widths, and can be applied without heating. It keeps well in all climates. The adhesive part of this variety of plaster consists of gutta-percha 2 parts; Burgundy pitch, 1 part; gum galbanum, 1 part. Rubber being the base, it will become neither too hard nor too soft, and it seems to retain its properties indefinitely. It is, however, open to the serious objection of being irritating, if kept long in contact with the skin, especially when it is employed for extension, maintained in the treatment of fractures of the lower extremity.

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* It is convenient to include at this place the section on India-rubber (Caoutchouc), though far removed in the Materia Medica.

All stages of irritation, from an erythema to deep ulceration of the skin, may be produced. In conditions where a plaster is to be kept long in contact with the skin, resin plaster is to be preferred. Rubber plaster, from its very adhesive properties, is of service when applied over a bandage, assisting to keep the turns in place. It is especially useful in retaining fracture dressings in the case of young children.

HÆMATOXYLON. Hematoxylon. Logwood.

Logwood is the "heart-wood of *Hæmatoxylon campechianum*." (U. S. P.) Its important constituents are a resin, hæmatoxylin, a volatile oil, and tannic acid. An extract (Extractum Hæmatoxyli) of uncertain strength is official.

Hematoxlyon is astringent. It enters into the composition of a lozenge, each lozenge to contain two grains of the drug.

HAMAMELIS. Witch-hazel.

"The leaves of *Hamamelis virginica*." (U. S. P.) The only official preparation is the fluid extract, which contains in each cubic centimetre the activity of one gramme of the drug.

The articles sold in this country under the various names of Pond's Extract, Distillate of Witch-hazel, Hamamelis, etc., originated in homœopathic practice, and are believed to be weak alcoholic distillates. The volatile oil contained in the drug imparts a peculiar odor to the distillate, but it is not known to possess medicinal properties.

The virtues of hamamelis are in the main dependent on the tannic acid therein contained and on the alcohol by which it is dissolved. Its preparations, therefore, are astringent and stimulant. The properties other than those above named are sedative, soothing, slightly anodyne, refrigerant and hemostatic.

The local effect of hamamelis is secured in convenient form by mixing equal parts of the fluid extract and glycerin; the mixture should be thoroughly shaken each time before using.

General Surgery.—As a topical application for SPRAINS, BRUISES, SUPERFICIAL INFLAMMATIONS, etc., the distillate has an extensive domestic use. It is much inferior to lead water and laudanum. Hamamelis has attained some reputation as a hemostatic. Consequently it is regarded as a valuable dressing for superficial WOUNDS and as a reliable agent in the treatment of CAPILLARY HEMORRHAGE, the bleeding from the sockets of extracted teeth, etc.

In the treatment of LEG ULCERS depending on a varicose condition of the veins, it is considered of service in relieving pain. It is applied, as are all wet dressings, by soaking lint in the distillate and retaining it by means of a bandage. Dujardin-Beaumetz believes that the drug here exerts some influence over the muscular walls of the vessels. Hector Guy and others assert that it possesses no special physiological action on the vascular system. Distillate of hamamelis has been used with benefit as a rectal injection in the treatment of HEMORRHOIDS. Owen (*Brit. Med. Jour.*, January, 1887), has reported the results obtained from forty-three physicians who had had favorable experience in the use of the distillate in this way,—two to four drachms being frequently injected through the day.

An ointment of hamamelis (twenty to thirty grains of the extract to the ounce of lard) will be found to be a soothing application to FISSURE OF THE RECTUM and FISSURED ANUS. The distillate properly diluted has been used as an injection into the bladder in cases of HEMORRHAGE dependent on the pressure of a vascular growth. Preston extols hamamelis in the treatment of PHLEGMASIA DOLENS.

Diseases of the Skin.—In some forms of ACUTE ECZEMA and PRURITUS, and especially as a local application in URTICARIA, witch-hazel, either in the form of the fluid extract much diluted, or, preferably, in the form of the distillate, has a beneficial effect. It should be applied on cloths as an evaporating lotion.

Diseases of the Nose.—The employment of hamamelis in the treatment of nasal catarrh is not general. In combination with chlorate of potash and glycerin G. Y. McCracken, of Philadelphia, finds it a valuable aid in the treatment of CHRONIC NASAL CATARRH. M. Mackenzie employs the tincture one-half ounce, glycerin ten minims, as a means of saturating a tampon of cotton for PLUGGING THE NASAL CHAMBERS.

"Hamamelis Wool."—Cotton, one drachm; glycerin, ten minims; dis. hamamelis, half an ounce. Mix the glycerin with the tincture, saturate the wool with the liquid, and dry.

Diseases of the Eye.—The distillate of hamamelis is a pleasant anodyne and sedative application to the eye, and, applied to the closed lids in the form of "Pond's extract," is quite a favorite popular prescription in ACUTE CONJUNCTIVITIS, and in the irritation of over-use or accommodative strain. Pieces of soft linen wet with it are placed on the lids and frequently renewed. For application to the conjunctiva it should be diluted with one or two parts of water, and may be used with boric acid or borax. An excellent soothing and slightly astringent prescription is: Borax, fifteen grains; boric acid, one-half drachm; mucilage sassafras pith, one-half ounce; distilled extract of hamamelis, one and one-half ounces; distilled water, one ounce, to be used freely with an eye-cup.

HUMULUS. Hops.

The strobiles of *Humulus lupulus*. The efficacy of hops as a sedative depends on the presence of lupulin, which consists in turn of a volatile oil associated with a resin. Fresh hops are always much richer in lupulin than old stock.

General Surgery.—Hops are employed in the form of poultices, and have long enjoyed a reputation for relieving pain. The poultice is best prepared by moistening with hot water the hops contained in a gauze bag, the desired size and shape, constituting what is known in domestic medicine as the *hop pillow*. A hop poultice may be employed, with great advantage over the heavier flaxseed poultice, in ABDOMINAL INFLAMMATIONS. It should be covered with waxed paper to retain the moisture. It is also indicated in ORCHITIS, either due to mumps or specific inflammation. Applied to the penis in GONORRHŒA it will assist in preventing CHORDEE.

Diseases of the Throat, etc.—Hops have long been used as a domestic remedy in INFLAMMATORY SWELLINGS of the upper respiratory passages. A little weak vinegar poured upon a pillow containing the hops may be placed near the patient's face and the fumes inhaled. Lupulin can be used in a similar manner. It is often employed in the first stage of ACUTE CORYZA. As an inhalant for ACUTE LARYNGITIS the following is recommended: ℞. Ext. lupulini, one ounce; sodii carbonat. exsiccat., one scruple; aquæ, one pint. In ACUTE LARYNGITIS, if rapidly progressive and accompanied with great pain, hot inhalations containing five grains of lupulin to the ounce of water are strongly recommended by W. E. Casselberry.

Diseases of the Eye.—A small bag of thin flannel, containing hop leaves and dipped in a hot infusion of this herb, forms a convenient means of applying moist heat in ophthalmic practice.

HYDRARGYRI CHLORIDUM CORROSIVUM. Corrosive Chloride of Mercury. Corrosive Sublimate. Mercuric Chloride.

Corrosive sublimate is in "heavy, colorless, rhombic crystals or crystalline masses, permanent in the air, odorless, having an acrid and persistent metallic taste and acid reaction; soluble in sixteen parts of water and in three parts of alcohol at 15° C. (59° F.), in two parts of boiling water, in one and two-tenths parts of boiling alcohol; and in four parts of ether." (U. S. P.)

The addition of equivalent weights of chloride of ammonia or chloride of sodium renders corrosive sublimate, because of the formation of a double salt, much more quickly and freely soluble than it is alone. The double chloride of mercury and ammonia is called "*sal alembroth*."

Albumin is an antidote for corrosive sublimate, since it forms a comparatively harmless and insoluble compound with it. Solutions of corrosive sublimate are neutralized by their contact or admixture with secretions, such as those in leucorrhœa or with cancerous ichor. On account of the albumin present it is also neutralized by blood, serum, and muscle fibre. The addition of a small portion of tartaric acid to the solution prevents the formation of an albuminate, and so increases its antiseptic power. It should be remembered, however, that "tartaric acid bichloride solution" is, by the very fact that the bichloride is not converted into an insoluble albuminate, much more rapidly and certainly absorbed than is the ordinary solution, and that risk of toxic impression attending its use is thereby increased.

Yellow wash (lotio flava, aqua phagedænica) is made by mixing one-half drachm of corrosive sublimate with eight fluidounces of lime-water. Collodions containing corrosive sublimate in proportions varying from ten to forty per cent. are sometimes used. Tablets containing nearly equal parts of corrosive sublimate and chloride of ammonium, and so weighted that one dissolved in a pint of water furnishes a solution of one part of corrosive sublimate in 1000 parts of the solution, are much used in surgery. The various surgical dressings, gauzes, cottons, wools, catgut, silks, etc., impregnated or made antiseptic by corrosive sublimate, are familiar and are too numerous to be enumerated.

Bichloride of mercury is antiseptic, antiparasitic, discutient, excitant, and caustic.

It is, on the whole, the most valuable of the germicides. While by actual test less destructive than the biniodide of mercury, it possesses advantages in its cheapness and degree of solubility.

According to the observations of Sternberg, Koch, and Jalan de la Croix, solutions of 1–10,000 to 1–40,000 destroy the spores of bacilli. It is well to state that Klein (*The Practitioner*, October, 1884) denies the germicidal properties of corrosive sublimate. In regard to the power of chloride to destroy the microörganisms of pus it ranks relatively to other germicidal agents as follows: Bichloride solution acid, 0.005 per cent.; permanganate of potash, 0.12 per cent.; carbolic acid, 1 per cent.; zinc chloride, 2 per cent.; creasote, 0.5 per cent.; iodine, 20.2 per cent. (Sternberg, "Report to the American Pub. Health Ass'n," 1888, p. 50.)

Laplace has found that the addition of small quantities of hydrochloric acid (five parts in 1000) to solutions of the bichloride of mercury has the same disinfecting power in albuminous as in non-albuminous fluids. For convenience corrosive sublimate is usually carried in solid form in the compressed tablet where tartaric acid is substituted for the hydrochloric acid in the same quantity.

In hospital practice a ten per cent. solution may be kept on hand, from which any dilution desired can be prepared. A compressed pellet, containing seven and one-half grains, being added to a pint of water makes a solution of 1–1000, which will be found a convenient and reliable means of preparing solutions for use in private practice. Antiseptic bichloride solutions are used in strengths from 1–500 to 1–5000. The stronger solutions, 1–500 and 1–1000, are only used for disinfecting the hands and skin. For irrigating wounds and small abscess cavities 1–2000 is generally employed. When continuous irrigation is kept up, and when the bichloride is employed in large cavities, a much weaker solution, 1–5000 or 1–10,000, should be used. To get the best results the surgeon must see that the solutions are freshly prepared, for if left exposed to the air for several days a chemical change takes place, slowly converting the bichloride into the proto-chloride. It has been found that a 1–10,000 hot solution is more active in destroying pus formation or for cleansing purposes, than 1–2000 used cold; hence all preparations for irrigation should be employed as hot as can be borne with comfort.

General Surgery.—In the preparation of cases for operation thorough cleanliness is first secured by shaving the part, and vigorously scrubbing it afterward with soap and water or turpentine; it is then washed with a strong solution of corrosive sublimate 1–1000, and, if time permit, a wet compress wrung from a warm solution is laid over it and retained with a bandage until exposed preparatory to the operation. By this means the skin and hair follicles are cleansed. In cases of CONTUSED and INCISED WOUNDS the same procedure is followed, the wound being washed by a stream of bichloride solution thrown from an irrigator or from the nozzle of a syringe. When the hemorrhage is controlled the edges of the wound are approximated by means of a suture, either of wire, silk, or catgut. Chinese silk is to be preferred, viz., that which has been sterilized by boiling in a solution of corrosive sublimate, 1–2000, afterward in distilled water, and kept for use in alcohol. If this method of preparing sutures is carried out the risk of formation of "stitch abscesses" will be eliminated.

Some disadvantages must be acknowledged in the use of corrosive sublimate, as, indeed, is the case with all other powerful germicides. In the first place, there exists the possibility of producing toxic effect in persons unusually susceptible to the action of the drug. Serous membranes absorb readily. For this reason the washing of the pleural and abdominal cavities with bichloride solutions is contraindicated. If such flushing be resorted to it is well to thoroughly remove all excess of fluid by rewashing with distilled water. The following case of acute poisoning is reported by W. Weiss: A large, fatty tumor had been removed. The wound was washed with a one per cent. solution of the chloride and dressed with sublimate gauze. In a few hours vomiting began, accompanied with sharp abdominal pains, death following on the third day. The autopsy revealed acute gangrenous inflammation of the colon and ilium, with parenchymatous degeneration of the kidneys. Several cases are reported where death has followed washing out of the uterus in obstetric practice, and also where hypodermic use of the drug was employed.

Corrosive sublimate solutions and dressings are often very irritating to delicate skins. Under such conditions the gauze should be applied dry. The parts may be dusted over with boric acid.

Bichloride solutions are unsuitable as disinfecting baths for instruments. During operations it is important that all cutting instruments should be kept out of the irrigating solution, as in a very short time their edges are destroyed.

Concerning the treatment of wounds which have become purulent before coming under the care of the surgeon, it is necessary to remember that the wound must be thoroughly washed daily, with a warm bichloride solution, 1–2000, and the part dressed with as much care as if non-infected. In a short time the discharge of pus will gradually cease, and the wound remain clean and odorless. After a wound has become infected carelessness in dressing will cause the infection to continue unalleviated through the course of the treatment, delay the healing process, and expose the patient to the risk of septicæmia.

In the successful treatment of a wound it is imperative to have perfect drainage (usually by means of the rubber or glass drainage-tube, cat-gut, or horse hair). After the proper approximation of the edges the surface for a considerable distance around should be covered with the bichloride gauze (*q. v.*), twelve to sixteen layers in thickness, covered over with a thick covering of cotton prepared with the bichloride, and the part supported by a firm bandage. Many surgeons are in the habit of moistening one-half of the gauze in a 1–2000 solution and removing the excess of water by pressure, while others use both layers dry. If the gauze is known to be freshly prepared and kept in a closed glass jar the latter is much the preferable method. The gauze not being surcharged with moisture readily absorbs all serous discharge, which occurs in wounds during the first twenty-four hours. Again, dryness is not favorable to the growth of micro-organisms. In the treatment of LACERATED and CONTUSED WOUNDS involving especially the hands and feet, where the vitality of the parts are much impaired, and where acute or secondary gangrene may occur, irrigation should be carried out as spoken of under the head of Aqua (*q. v.*), except that the fluids should be sterilized and corrosive sublimate added, making a solution of a strength from 1–1000, 1–10,000, used either warm or cold, as the judgment of the surgeon may dictate. By the pursuance of this method of treatment many limbs can be saved which otherwise would be sacrificed, and the development of tetanus in great part prevented. In treating the BITES OF ANIMALS the wound should be encouraged to bleed freely, and then flushed with a solution of bichloride of mercury, 1–2000. The fluid is preferably thrown with some force from the nozzle of a syringe. If the animal is known to be rabid it is best to excise the tissue around the wound, wash out with the corrosive solution, and then cauterize with a hot iron.

In the genito-urinary tract corrosive sublimate has an extensive field of use, depending almost entirely upon its antiseptic properties. In the treatment of Gonorrhœa J. W. White (*Public Clinic*) is in the habit of using an injection of solution of corrosive sublimate in strength from one-quarter to one-half grain to an ounce in combination with boric acid, and sulphocarbolate of zinc. The following prescription is also recommended: ℞. Hydrarg. bichlor., gr. ii–iv; zinci sulph. carbolat., gr. ii–x; acidi borici, ʒj; hydrogen. peroxidum, ℥j; aquæ, *q. s.*, ad. ℥viij. Bichloride of mercury is used in varying strengths up to as high as 1–1000 with the object of aborting the disease. We have seen solutions of 1–2000 cause severe pain and increase the grade of inflammation in the first stage of Acute Gonorrhœa. E. L. Keys ("Genito-Urinary Disease with Syphilis," p. 66) states that he has never been able to entirely arrest a true gonorrhœa at once with corrosive sublimate, or to kill the micrococcus. The irrigating of the urethra in a mild solution (1–20,000, 1–40,000), as advised by Halstead, to be used with a fountain syringe, is often followed by good results. In our experience the treatment with bichloride solutions is inferior to that obtained from solutions of salts of zinc and lead, with opium.

In Specific Vaginitis or Gonorrhœa, in the female, the solution of corrosive sublimate has been found a reliable means of treatment. It can be borne much stronger than in the male, as a rule, without causing pain. It may be used in strength from 1–4000 to 1–10,000, beginning with the weaker solution. Corrosive sublimate is in constant use as an antiseptic in uterine and vaginal surgery, as, for example, in operations for lacerated cervix, ruptured perineum, etc., as well as for flushing the uterus after childbirth. In obstetric practice creolin (*q. v.*) is being substituted largely for this agent with equally good results and little danger of producing toxic symptoms.

Diseases of the Skin.—Bichloride of mercury has been long and extensively used in the local treatment of diseases of the skin.

In hypertrophic affections of the epidermis, as Lentigo, a solution of two to four grains of bichloride of mercury to the ounce of alcohol painted on the skin a number of times successively causes an exfoliation, which, in time, relieves the skin of the brown discoloration. A solution of ten to twenty grains to the ounce of collodion is effectual in the removal of superficial Nævi and Xanthoma. In Telangiectasis a twenty-grain solution painted on daily for several successive days causes the formation of a white crust, which after a time separates and the growth is found to have been destroyed. Such solutions must be used with great caution.

As a parasiticide, a lotion of one grain of the bichloride to an ounce of vinegar destroys PEDICULUS PUBIS and PEDICULIS CAPITIS, and, at the same time, the ova of these parasites, which cling to the hairs. In TINEA CIRCINATA and in small patches of TINEA VERSICOLOR a solution of two to four grains of the bichloride in an ounce of the compound tincture of benzoin, painted on the affected parts once or twice a day, as recommended by Taylor, of New York, is efficacious. A solution in alcohol of similar strength may be painted on the smaller patches of RINGWORM of the scalp. Recently electricity, applied from the negative pole of a constant current battery has been employed to facilitate the penetration of this parasiticide. Such applications should be made cautiously, and not over too large a surface at any one time for fear of absorption with toxic effect.

In ERYSIPELAS, Eppstein (*Therap. Monatshefte*, No. 4, 1891) has used a one per cent. ointment of this salt in lanolin with excellent results.

White, of Boston, has recommended the employment of an ointment of ten to forty grains of bichloride of mercury to the ounce of lard, or of a solution of similar strength in castor oil as an application in LUPUS VULGARIS.

A mixture of bichloride of mercury with creasote has been described under the latter head. It is an efficient application in LICHEN PLANUS and LICHEN RUBER.

Bichloride of mercury enters into the composition of a famous lotion formerly, and still to some extent, employed in the treatment of ACNE, under the name of "Gowland's lotion." It is composed as follows: ℞. Hydrarg. bichlor., gr. vij; alcoholis, ♏xx; misturæ amygdalæ, *ad* f℥iv. M.

Diseases of the Ear, Nose, and Throat.—In the treatment of OTORRHEA a solution of from 1–10,000 to 1–3000 is held in high esteem. Late writers (Schwartze, Laplace, and C. Behrens) employ tartaric acid to lessen the coagulating of tissue, in the following formula: ℞. Hydrargyri bichlor., gr. ss (0.032 grammes); acidi tartarici, grains xx (1.29 grammes); aquæ, ounces iv (124.4 grammes). One-tenth of one per cent. to one per cent. solution according to J. Gottstein (*Archives of Otology*, vol. XIII, 1884) is sufficient to sterilize the ear. In place of instillation, W. Kirchner (*Monatschr. f. Ohrenheilkunde*, August, 1885, 229) saturates a delicate cotton string or cord about two millimetres in thickness in a weak solution of corrosive sublimate. Remembering the powerfully toxic character of the preparation care should be exercised in the use of corrosive sublimate in the middle ear, no matter what strength is used. The recognition of the bacillar nature of AUDITORY FURUNCLE renders the advice to saturate the wound made after incision with a lotion of bichloride of mercury (1-10,000, 1-3000) fruitful of good results. ACUTE ECZEMA of the auditory passage is treated by Miot and Baratoux (*Rev.*

gen. de Clin. et de Therapeut., January, 1889) by a solution of corrosive sublimate 1-200; boric acid, 1-35; sodium bicarbonate, 1-200.

Maas' Mixture is as follows: Corrosive sublimate, 5 parts; sodium chloride, 500 parts; glycerin, 200 parts.

In the treatment of nasal affections corrosive sublimate is not in such general use as in that for diseases of the ear. One of its most important applications is for the DESTRUCTION OF MAGGOTS in the nasal chamber and adjacent sinuses. In proportions sufficient to be of use as a germicide it is also irritating. Nevertheless, W. C. Jarvis speaks highly of it in the treatment of CHRONIC CATARRH. Gottstein, in the treatment of OZÆNA, inserts a nasal tampon wet with a weak solution. Gomez de la Mata employs a solution of 1-6000 in the same affection. 1-4000 has proved in the hands of the writer to be unmanageable. Its use should be always followed by a soothing wash. Bouchut recommends the following snuff in ATROPHIC RHINITIS: Hydrarg. bichl. and oxide of mercury each one part; sugar twenty parts.

Bichloride of mercury is one of the most powerful deodorizers of secretions of the mouth that is known. It is recommended by W. D. Miller ("Micro-organisms of the Human Mouth," p. 234) to be used as a mouth wash for DENTAL CARIES and FETOR in the proportion of 1-2000. The objection urged against this, that a risk of toxic impression is incurred by the solution being swallowed, is not valid. The taste of the bichloride is conveniently disguised by rose water. Under any circumstances great care should be exercised in prescribing it, nor should it be used for a long time.

CROUPOUS DISEASES generally can be treated by the same means.

J. Bryson Delavan recommends a solution of 1-2000 in local application to tonsil crypts which are known to be affected with LEPTOTHRIX BUCCALIS. PHLEGMONOUS TONSILLITIS is asserted to be of bacterial origin and is appropriately treated with a spray of hydrarg. bichlor. 1-1000; local application is made with a brush to the affected surfaces. A spray of 1-5000 can be used in ordinary PHARYNGITIS, recommended by J. J. E. Maher (*Med. Rec.*, November, 1890), and as a gargle by many writers. SYPHILITIC PHARYNGITIS has long been treated by this agent. Charles Bell's gargle ("Institutes of Surgery," 1837) ("Dunglison's Am. Med. Lib.," 1840, 352) is as follows: ℞. Hydrarg. oxymurat. (bichlor.), four grains; spirit. rectif., two drachms; decoct. cinchon., six ounces; mel. rosæ, tinct. myrrhæ, āā two ounces. A spray of bichloride of mercury 1-1000 is recommended by S. Johnston. This is greatly in excess of what would be prudent for the average case of SYPHILIS OF THE PHARYNX.

The local use of bichloride of mercury in the treatment of DIPHTHERIA is one which of late years has been crowned with success at the hands of careful observers. In addition to its well-known value as an internal medicament in this disease, it is doubtless useful as a local application. It is necessary to estimate the influence exerted by the local medicament by absorption, in order that the impression may not be added externally to that given internally at the same time. E. N. Oatman, of Nyack, N. Y. (J. Lewis Smith, *N. Y. Co. Med. Ass'n*, December, 1887), recommended that the solution of one part to about 4000 (about two grains to the pint) be employed. A cotton carrier is the best instrument by which the solution can be brought in contact with the affected surfaces. Two grains to a pint constitutes a strength recommended by Potter for Diphtheritic Deposits. A strength of 1–10,000 has been used in Diphtheria (Massei, *Deutsche Med. Zeitung*, 1881). W. Porter (*Trans. American Laryngological Ass'n*, 1887) speaks highly of a warm spray in the treatment of this disease. Since it is of importance to bear in mind the amount of the drug which can be borne by the system at any time, the following table has been drawn up by Dr. L. Smith (*N. Y. Co. Med. Ass'n*, December, 1887).

To a child of	two years	. . . .	one-sixth grain.
" "	four "	. . . .	one fourth "
" "	six "	. . . .	one-third "
" "	ten "	. . . .	one-half "

J. N. Mackenzie (*Trans. Ninth International Med. Congress*, Washington, 1887, vol. IV) and J. L. Porteous (*Edin. Med. Jour.*, May, 1887) employ a similar spray in Laryngeal Phthisis. A. S. Houghton directs a preparation for spray inhalation, composed as follows: Hydrarg. bichlor., four grains; ammon. chl., ten grains; glycerin, two ounces; aqua, eight ounces.

Diseases of the Eye.—The bichloride of mercury has been more extensively used in ophthalmic surgery than any other antiseptic. Its limitation is found in its irritating effect upon the eye, which prevents the application of such strong solutions as are used by general surgeons. According to Guaita (*Annals d'Oculist*, 1886, p. 275), solutions of 1–7000 instilled in the eye cause no perceptible irritation; of 1-5000 cause slight burning and congestion; of 1–2000 decided congestion with severe burning sensation, and stronger solutions than 1–1000 should never be used in this way. In the strength of 1–300 painted on the everted eyelid it is slightly caustic; rather less so than silver nitrate 2–100 (about ten grains to one ounce). Sattler, in bacteriological experiments with micrococci taken from the lachrymal passages, found that a solution of 1–5000 of bichloride entirely stopped the multiplication of germs in two or three minutes. This solution is generally well borne by the conjunctiva, particularly if cocaine is used, and is preferred by many surgeons to any other antiseptic wash in operations upon the eye. The brow and the closed eyelids are first disinfected, after careful washing with soap and water, with a stronger solution (1–2000), and the conjunctival sac is freely douched with the 1–5000 wash before, and, by some surgeons, during and after the operation. Others, after the first thorough disinfection, prefer to use boric acid. The application of bichloride has been thought by some to cause corneal opacity, especially when used in connection with cocaine (see article on Cocaine), and the danger of this is to be considered when strong solutions are used. When injected into the anterior chamber, after cataract extraction, there is little doubt that it has caused striped keratitis, and its use in this way has been generally abandoned. Its free application to the cavity of the orbit after enucleation of the eyeball is particularly recommended.

The bichloride has long been used as a collyrium in CONJUNCTIVITIS. It was the chief ingredient in the Mackenzie wash (1–12,000), and is now a favorite application in purulent ophthalmia in solutions of about 1–5000, or weaker. The conjunctival sac is washed with it every two or three hours.

Dujardin, in 1884, strongly recommended bichloride in the treatment of trachoma, painted on the everted lid, as silver nitrate is applied, in solution of 1–250. This treatment has since been discovered by several other surgeons, who have used various strengths, and it may be a useful addition to the list of remedies in this chronic and obstinate affection.

HYDRARGYRI CHLORIDUM MITE. Calomel. Mild Chloride of Mercury. Mercurous Chloride.

"A white, impalpable powder, permanent in the air, odorless and tasteless, and insoluble in water, alcohol, or ether." (U. S. P.)

"Black wash" (lotio nigra) is made by adding a drachm of calomel to a pint of lime-water and shaking thoroughly. It should be well shaken each time before using.

Calomel is discutient, stimulant, and desiccant.

General Surgery.—Calomel is the form of mercury now usually employed for FUMIGATION. It should be especially prepared and absolutely pure. Various complicated apparatus have been devised for its administration, but nothing can be better than a simple porcelain dish with two compartments, one containing from twenty to thirty grains of calomel and the other about two ounces of water, suitably held over a spirit lamp, over which is placed a cane-seated chair. The patient is seated surrounded by a loose cape or blanket fitting tightly around the neck. The calomel is sublimed by heat and deposited with water on the patient's skin. When the process is completed the patient is wrapped in a flannel gown without washing or drying, and placed at once in bed. This method has the same advantages as that by inunction, and is efficient. Both have the disadvantage of being more troublesome than administration by the mouth.

Black wash forms an admirable stimulating dressing for VENEREAL SORES, especially in the early inflammatory stage, or after cauterization with one of the stronger acids. It is best applied by pieces of lint or old linen saturated with the solution and applied several times daily. The mixture should be well shaken before using.

The powder of calomel may be dusted over the surface of VENEREAL ULCERS where the action is indolent, and is often productive of satisfactory results.

Diseases of the Skin.—Among the mercurial preparations calomel is one of the most commonly used in the treatment of diseases of the skin.

In the form of ointment, from five to twenty grains to the ounce, it forms an admirable discutient and stimulant application in SUBACUTE AND CHRONIC ECZEMA, and in some of the syphilodermata. In SUBACUTE ECZEMA OF THE HANDS an ointment of five to fifteen grains of calomel to the ounce of oxide of zinc ointment forms an admirable application. If applied in cases where the eruption is of an acute inflammatory character the calomel ointment often proves too stimulating. In any case care must be taken not to apply it over too large a surface, as salivation occurs more frequently with this than with any other preparation of mercury.

Calomel has been used as a hypodermic application in SYPHILIS, but it has not in our hands proved satisfactory. It is difficult to reduce the drug to a sufficiently fine powder to become suspended in the liquid, and we think that abscesses are more likely to result at the point of injection than with other preparations. It is said that the gradual absorption of the nearly insoluble salt ensures its gradual and regular entrance into the economy, but we have not observed the prolonged action of the drug asserted by its advocates. The following is the formula usually recommended: ℞. Pulv. hydrarg. chlor. mite, gr. j ¾; glycerin., ♏xv. M. For a single injection. A similar one is: ℞. Hydrarg. chlor. mite, gr. jss–ij; pulv. acaciæ, gr. ¾; aq. destillat., ♏xv. M. Two injections of this amount on successive days in the region of the nates, and then three weeks' interval occurs before a similar amount is again employed.

F. H. Kane (*Dubl. Jour. Med. Sci.*, November, 1874) has devised an apparatus by which the vapor of sublimed calomel can be directed on any part of the skin. Three to five grains are heated in a glass-bulbed tube with a fine point, and as the vapor begins to rise a current of air is blown through the tube by a rubber hand-ball carrying the vapor with it. Walter G. Smith (*Br. Med. Jour.*, May 7, 1881) has likewise used this apparatus with satisfaction.

Diseases of the Ear, Nose, and Throat.—Calomel has a reputation second only to that of the bichloride in the treatment of OTORRHŒA. The parts should be first washed out thoroughly with a solution of bichloride of mercury and the calomel used subsequently as an insufflation (*Year Book of Treatment*, 1885). Black wash is often employed as a remedy for ECZEMA of the auricle. Calomel in the proportion of five to eight grains to an ounce of powdered sugar or bismuth subnitrate, is a favorite remedy with many practitioners for inflammatory states of the interior of the nose. It is especially indicated in CHRONIC PURULENT CATARRH of children and in SYPHILIS. Calomel is of repute in the local treatment of DIPHTHERIA. The powder may be floated on a teaspoonful of cold water and the whole conveyed to the open mouth. While the bulk of the powder adheres to the sides of the tonsils and pharynx a small portion will be swallowed. This method of treatment has been popularized by W. H. Daly (*Trans. American Laryngological Ass'n*, 1889). A similar treatment is efficacious in the treatment of CROUP. Thrown upon the vocal cords by insufflation, calomel has been found useful by Tchernoff (*St. Olga's Hospital Reports*, 1888, p. 19) for SYPHILITIC LARYNGITIS.

Diseases of the Eye.—Calomel is a valuable local application in PHLYCTENULAR OPHTHALMIA, though, as it is insoluble, the rationale of its action is not easily understood. That it is something more than a mechanical irritant has been shown by experiments in which inert powders were substituted without producing the same effects. It is used as a fine, dry powder, and is dusted directly upon the ulcer from a camel's-hair brush. The brush is held between the forefinger and thumb and "flicked" with the little finger of the same hand. Calomel should not be used when there is much ciliary irritation, shown by photophobia, lachrymation, and contracted pupil, but after this has been subdued by atropia and other remedies. It is also useful in CHRONIC VASCULAR KERATITIS and PANNUS, and in small indolent ULCERS and SUPERFICIAL OPACITIES (nebula) OF THE CORNEA.

HYDRARGYRI IODIDUM RUBRUM. Red Iodide of Mercury. Biniodide of Mercury. Mercuric Iodide.

"A scarlet-red, crystalline powder, permanent in the air, odorless and tasteless, almost insoluble in water, soluble in 130 parts of alcohol at 15° C. (59° F.), and in 15 parts of boiling alcohol; also soluble in solutions of iodide of potassium or of mercuric chloride." (U. S. P.)

The red iodide of mercury is antiseptic, germicidal, resolvent, irritant, and, in strong impression, almost caustic.

General Surgery.—Biniodide of mercury in its irritant properties resembles corrosive sublimate, and its uses are similar. It has been strongly advocated as an antiseptic in preference to the bichloride by Bernardy, of Philadelphia, and others. It undoubtedly possesses great germicidal properties which equal, if they do not exceed, those of the bichloride. Limitations to its usefulness lie in its expense and relative insolubility. In comparing the germicidal properties of the various mercurial salts, we quote the experiments, which were carried out with accuracy, by Sternberg and Abbott. (*Am. Pub. Health Rep.*, p. 51.)

	Active.	*Failed.*
Biniodide,	1–20,000	1–40,000
Bichloride,	1–15,000	1–20,000
Protiodide,	1–10,000	1–20,000
Yellow oxide,	1–1000	1–2000
Black oxide,	1–500	1–1000
Calomel,	. . .	1–100
Blue mass,	. . .	1–100

In the treatment of BRONCHOCELE, Monat, MacNamara, and others have had marked success with this drug. These writers direct that an ointment, fifteen grains to the ounce, be rubbed over the surface of the goitre, which should then be exposed to the sun's rays as long as can be borne. Within half an hour a smarting sensation is complained of, in an hour a blister is formed, which is to be treated in the usual way. The good effects of the iodide continue long after the blister has healed, and the tumor decreases day by day for several weeks.

Diseases of the Skin.—The red iodide of mercury is employed in dermatology in the form of "Rochards' ointment," which is composed of four grains of iodine melted with ten grains of calomel, until combination takes place, and then rubbed up with an ounce of lard.

This is strongly stimulant, almost caustic in character. It is sometimes used in the treatment of small, chronic patches of LUPUS ERYTHEMATOSUS.

Diseases of the Nose and Throat.—The iodide of mercury is of use in the treatment of SYPHILITIC ULCERATIONS of the mouth and throat. Moloney (*Australian Med. Journal*, February 15, 1885) advises a fresh mixture of one-half grain to the ounce of water, to which has been added one drachm of acacia mucilage. J. S. Cohen employs a lotion for the nose in the treatment of OZŒNA. It has been used in the form of a powder in SYPHILITIC CORYZA. C. R. Illingworth (*British Med. Journal*, November 3, 1888) uses biniodide of mercury, one part to two thousand, as a nasal douche and spray in the same diseases. G. W. Major (*N. Y. Med. Journal*, September 24, 1887) values it in the form of an ointment to be used over the region of the larynx, in inflammation tending to ankylosis of the cricoarytenoid articulations. Biniodide of mercury is offered for sale in the form of compressed tablets, in combination with potassium iodide. Each tablet contains six grains of both salts. In the proportion of one part to a quart of water the tablet represents a solution of 1–2500. It may be used as a germicide.

Diseases of the Eye.—The red iodide of mercury has been extensively used as an antiseptic in ophthalmic surgery, in the preparation known as Panas' solution, which consists of the red iodide 1 part, alcohol 400 parts, and water 20,000 parts. It is difficult to understand why this infinitesimal proportion of the salt should be preferred to the familiar solutions of the bichloride, particularly as antiseptics of established reputation are said, by good authorities, to lose their germicidal properties when dissolved in alcohol. Some chemists have even claimed that the biniodide is precipitated when added to the water, and is not to be detected in the Panas' solution.

HYDRARGYRI IODIDUM VIRIDE. Green Iodide of Mercury.

"A dull green to greenish-yellow powder, becoming more yellow by exposure to air, and darker by exposure to light, odorless and tasteless, almost insoluble in water, and wholly insoluble in alcohol or ether." (U. S. P.)

Diseases of the Skin.—The green iodide of mercury in an ointment of two to fifteen grains to the ounce of lard has been used as a stimulating application in ACNE.

HYDRARGYRI OXIDUM FLAVUM. Yellow Oxide of Mercury. Yellow Mercuric Oxide.

"A light orange yellow, heavy, impalpable powder, permanent in the air, and turning darker on exposure to light, odorless, and tasteless, insoluble in water or alcohol, but wholly soluble in nitric or hydrochloric acid." (U. S. P.) This authority contemplates an impalpable powder, one which shall not show crystalline structure under the microscope. From this oxide an oleate of mercury (oleatum hydrargyri) is made which contains ten parts of yellow oxide of mercury in combination with enough oleic acid to make one hundred parts. An ointment of yellow oxide of mercury (Unguentum Hydrargyri Oxidi Flavi) containing ten parts of the oxide in one hundred parts of the ointment is also official.

The yellow oxide of mercury is alterative and (according to A. Rose, *Med. Record*, April 25, 1885) antiseptic.

Diseases of the Skin.—The yellow oxide of mercury is employed in the same way as the red oxide, but has the advantage of occurring in the form of an impalpable powder. An ointment of this salt of the strength of ten to twenty grains to the ounce or even stronger forms an excellent stimulating application to small patches of Eczema. The following ointment is valuable in Eczema of the Eyelids: ℞. Hydrarg. ox. flav. gr. vj.; vaselini, ʒiv. M. A small quantity may be placed under the edge of the lids.

Diseases of the Ear, Nose, and Throat.—An ointment of the yellow oxide of mercury is a valuable application for Pruritus of the external auditory passage. Wilde conceived that it was more efficient when cod-liver oil was substituted for neat's foot oil. One grain of the salt with one drachm of cosmoline, to which one-half grain of hydrochloride of morphine may be added, forms the basis of an ointment which is highly recommended by C. S. Turnbull (*Med. and Surg. Reporter*, February 19, 1881) as an application in Chronic Rhinitis as well as to the external meatus in which there is an absence of cerumen. It takes the place of the cerumen besides acting upon the infiltrated walls of the passage. Turnbull's statement agrees with the experience of the writer, who has found that the official ointment is much too strong for use in the nose. One drachm of yellow oxide of mercury to nine drachms of oleic acid is recommended by Lefferts as an external application to Fibrous Goitre or of the Indurated Cervical Glands. S. Johnston believes that this compound is valuable where a mercuric impression is desired in the local treatment of Rhinitis after the exhibition of more active remedies.

Diseases of the Eye.—The yellow oxide of mercury is particularly adapted for ointments intended to be applied to the eye, as, being an impalpable powder, it does not act as a mechanical irritant. It was introduced into ophthalmic therapeutics by Pagenstecher, and the ointment is sometimes known by his name. It has been used by different surgeons and in different conditions, in proportions varying from half a grain to four grains to the drachm of any unirritating ointment, as vaseline, lard, amyloglycerin, lanolin, etc. The most generally useful strength is a grain to the drachm. In Simple Acute Conjunctivitis, with a tendency to incrustation of the lashes, one-half grain to one drachm answers well, while in Chronic Blepharitis Marginalis, two grains to one drachm will be more efficient, but should be applied only along the roots of the cilia and not be allowed to enter the eye. It is in inflammations of the margins of the lids that mercurial salts are most useful, and the "yellow ointment" is an almost universal favorite in the treatment of these affections. It is usually applied at bed-time, and allowed to remain in contact with the margins of the lids during the night. In Phlyctenular Ophthalmia the ointment may be applied directly to the eyeball by introducing a piece the size of a large pin-head beneath the upper lid. Its use in connection with massage has also been highly recommended in the treatment of Corneal Opacities, Chronic Keratitis, and Pannus.

HYDRARGYRI OXIDUM RUBRUM. Red Oxide of Mercury. Red Precipitate. Red Mercuric Oxide.

"Heavy, orange-red, crystalline scales, or a crystalline powder, becoming more yellow the finer it is divided, permanent in the air, odorless, and tasteless, insoluble in water or alcohol, but wholly soluble in nitric or hydrochloric acid." (U. S. P.) No matter how carefully triturated or levigated, the microscope shows that the salt retains its crystalline character. Hence, ointments of the salt are more irritating than are those of other forms of mercury. On the other hand, the permanence of the crystals adapts the red oxide to uses on indolent surfaces when an excitant effect is desired. It is one of the most poisonous preparations of mercury. In action it is both stimulant and escharotic, employed either as a dusting powder or an ointment. An ointment (Unguentum Hydrargyri Oxidi Rubri), containing ten parts of the oxide in one hundred parts of the ointment base, is official.

General Surgery.—In SYPHILITIC ULCERATIONS where the granulations are indolent the surface of the sore may be dusted with equal parts of the red oxide of mercury and starch, or be dressed with the ointment; this proves an excellent application, stimulating the surfaces and rapidly changing the character of the discharge and hastening the healing process. Care must be exercised not to expose too large a surface at once, as the salts may become absorbed and induce salivation. The red oxide of mercury may be employed as a dusting powder in the treatment of CHANCROID SORES in place of iodoform; it possesses the advantage of being free from odor. An ointment (ten grains to one ounce) has been highly recommended by T. Smith. The mass is spread on lint and applied to the skin over an INFLAMED BUNION, to hasten the absorption of fluid in the bursa.

Diseases of the Skin.—The red oxide of mercury is an admirable stimulant employed in ointment of five to twenty grains to the ounce in circumscribed patches of CHRONIC ECZEMA. On account of the difficulty of obtaining the drug in an impalpable powder the yellow oxide has of late largely taken its place.

Diseases of the Nose.—This agent is of great value in the treatment of ECZEMATOUS and other inflammations of the external nose and the interior of the nostrils. A favorite prescription of Trousseau for CHRONIC CORYZA was a powder thrown up the nostril, of forty grains of the finely powdered drug added to an ounce of sugar.

Diseases of the Eye.—The red oxide of mercury, in the form of ointment, was formerly much used in ophthalmic surgery, but of late years has been generally supplanted by the yellow oxide. It may be used in the same way as the latter.

HYDRARGYRI OXYCHLORIDUM. Oxychloride of Mercury.

Mercuric oxychloride is prepared by boiling a solution of corrosive sublimate with oxide of mercury. The solution is filtered and cooled to 60° C., when a whitish precipitate separates out, consisting of several oxychlorides of mercury. Most of these oxychlorides are insoluble in alcohol, and are by this liquid separated from corrosive sublimate.

Diseases of the Eye.—Chibert (*Annal. d' Oculist*, CI, 252) claims that the oxychloride of mercury is superior to the bichloride as an antiseptic in ophthalmic surgery, because it is better borne by the tissues and does not injure instruments. He bathes the eye freely with a solution of one to fifteen hundred, and states that the most delicate instruments are not injured by immersion for ten minutes in a solution of one to one hundred.

The oxychloride was recommended by Lawrence, nearly sixty years ago, as an application in the treatment of Purulent Ophthalmia, in the strength of one or two grains to the ounce; and was the chief ingredient in the "aqua conradi" (oxymuriate of mercury, gr. j; mucilage quince seed, ʒj; tinct. of opium, ʒj; rose water, *ad* ℥vj), which, twenty years ago, was a favorite prescription on the Continent for Conjunctivitis.

HYDRARGYRI SUBSULPHAS FLAVUS. Yellow Subsulphate of Mercury. Turpeth Mineral. (Hydrargyri Sulphas Flava. Pharm., 1870.) Basic Mercuric Sulphate.

"A heavy lemon-yellow powder, permanent in the air, odorless, and almost tasteless, insoluble in water or alcohol, but soluble in nitric or hydrochloric acid." (U. S. P.)

Diseases of the Skin.—Turpeth mineral is used by French physicians in the treatment of Alopecia and Pityriasis Capitis, being employed in ointment of the strength of ten to fifteen grains to the ounce.

Diseases of the Ear.—F. W. Hinkle recommends, in the earliest stage of Acute Inflammation of the Middle Ear, an ointment of yellow sulphate of mercury, one grain to the ounce, applied freely about the pharyngeal orifice of the Eustachian tube and vault of the pharynx.

HYDRARGYRUM. Metallic Mercury. Quicksilver.

"Shining, silver-white metal, liquid at temperature above —40° C. (—40° F.), odorless and tasteless, and insoluble in ordinary solvents, but soluble in nitric acid without residue. Specific gravity 13.5." (U. S. P.)

In its pure state mercury appears to be almost an inert substance, as large quantities of it have been taken without producing any effect. But when it is subdivided, broken into minute particles, its action is much more energetic.

General Surgery.—When rubbed into the skin in minute subdivisions its action is increased. It is readily taken up into the system through the cutaneous absorbents, and has been detected in all the secretions, as the blood, urine, saliva, and milk. If the use of mercury (either local or general) is prolonged with the purpose of impressing the system, it produces a specific effect upon the salivary glands known as *mercurial salivation* (ptyalism). In salivation emaciation ensues, the blood becomes watery and loses its power of coagulation. In saliva, under the same systemic condition, Simon found an increase of the solid matters, and Bostock states that it is less viscid than in a healthy state, and contains a substance analogous to coagulated albumen.

Mercurials hasten the *absorption* of morbid fluids and materials of low organization, *e.g.*, the albuminous materials which are deposited by syphilis. In small quantities mercury undoubtedly possesses a *tonic* action and increases the number of red blood corpuscles. Its use is specially indicated in SYPHILITIC ANÆMIA. Various constitutional effects are noted from the cutaneous absorption of the drug. Miners and artisans who are exposed daily to contact with its salts, suffer from palsy, wrist-drop, etc. In some cases the prolonged exposure has produced a condition similar to scurvy, manifested by emaciation, general loss of strength, alopecia, and aching pains in the bones. Owing to idiosyncrasy, some subjects are unable to use mercury in any form without serious consequences. A case is reported of exfoliation of the jaw and death ensuing upon the use of three drachms of the ointment rubbed into the skin. When the system is in a low, broken-down state the action of all mercurials is to be deprecated. Children and old persons are difficult subjects to bring under its influence. Persons in robust health likewise resist its influence. In some inflammatory conditions, as of the brain and peritoneum, a patient will often withstand the influences of the drug for a long time.

The local employment of mercury relates to its value when used in the treatment of SYPHILIS and kindred states, as a parasiticide, and as a remedy for inflammation.

EMPLASTRUM HYDRARGYRI. Mercurial Plaster.

Mercurial plaster is made by incorporating thirty parts of mercury, first, with ten parts of olive oil and ten parts of resin melted together, and, afterward, with fifty parts of melted lead plaster, so that the finished plaster contains thirty per cent. of mercury.

General Surgery.—Mercurial plaster is useful as a surgical dressing in cases of articular diseases, such as CHRONIC SYNOVITIS, etc. Its efficacy depends upon three conditions: 1. Its mechanical support to the affected part; this is sufficient, provided the plaster is spread on firm leather and is of sufficient thickness; 2. Its mild, counter-irritant action, which tends to relieve the deeper vessels of their blood, and in that way to diminish inflammation; 3. The specific alterative effect from the absorption of mercury, on account of the dilated state of the cutaneous vessels. The continuous use of this preparation of mercury may cause slight ptyalism, consequently the surgeon should be constantly on the alert for such symptoms, especially in susceptible subjects. It should be discontinued on the first approach to any tenderness about the gums. Mercurial plaster has long been used with success for the removal of SYPHILITIC NODES and GLANDULAR ENLARGEMENTS. It appears to assist in reducing the size of the spleen in malarial poisoning.

But on the whole it may be said that the belladonna and mercurial ointment (*q. v.*) has superseded the use of mercurial plaster in most cases.

UNGUENTUM HYDRARGYRI. Blue Ointment. Mercurial Ointment.

Blue ointment is made by incorporating metallic mercury with lard. This preparation of mercury is probably the one most generally used as a topical application, in order to rapidly bring the system under the direct influence of the drug. In the treatment of SYPHILIS, Keys prefers mercurial ointment of the Pharmacopœia in preference to any made with lanolin. He says, "The oleates which I formerly used I have given up. They irritate the skin more frequently than ordinary mercurial ointment." According to Brodie, mercury used by inunction neither gripes nor purges, and the general impression is well borne as compared to other methods.

It is used in the "Kur" at Aix-la-Chapelle, and to this circumstance the reputation of this locality is largely due. About half a drachm of the ointment is rubbed upon the skin by a trained attendant for periods ranging from twenty to thirty minutes at a time. The course is usually a month. It is customary to advise patients to return after the lapse of a few months to complete the cure. Excellent results are obtained in this way in many cases that have baffled ordinary methods of treatment. As Mr. Hutchinson ("Syphilis," p. 57) believes, everything that is done at Aix can be done equally well at the patient's home, provided that all precautions are preserved.

In conducting mercurial inunction the following details will prove useful. The ointment should be rubbed into different places on successive days and so avoid the tendency to cutaneous irritation. Generally it is best borne on the sides of the chest and abdomen, although the axilla, the groin on the inside of the thighs, where the skin is delicate, are favorite localities. There is no doubt that absorption is more rapid when applied to the groin and axilla, but in a short time a troublesome eczematous eruption is developed about the roots of the hair follicles.

The best time for the inunctions is in the evening. The patient should put on a flannel gown and retire without bathing.

In dispensary practice, where many persons are prescribed for who are not apt to obey directions, we advise that a piece of ointment about the size of a hazelnut be smeared over the sole, after which the stocking is replaced.

In subacute Synovitis, especially of the knee joint, with effusion, no remedy has met with warmer approbation than the persistent use of the ointment of mercury. Mr. Adams uses inunctions over blistered surfaces. In chronic cases the following, known as Scott's dressing, is recommended: ℞. Ung. hydrarg., ℥j; camphor, ʒj. This preparation is also known as the Cerat Hydrarg. Comp. (London Ph.) This dressing, when conjoined with firm pressure and complete rest, is often followed by excellent results. Equal parts of mercurial and belladonna ointments, spread on lint and laid over the injured surface, in the subacute and chronic stages of articular disease, is also an admirable dressing. It possesses the antiphlogistic and absorbent properties of mercury and also the local sedative effect of belladonna. In Peritonitis after counter-irritation has been made either with turpentine or blisters over the surface of the abdomen, much good can be obtained by covering the abdomen with the belladonna and mercury ointment. It should be spread on lint and overlaid by a hot poultice. The same treatment is applicable to Pelvic Cellulitis. In Angioleucitis following dissecting wounds the course of the inflamed lymphatics may be covered with mercurial ointment spread on lint, the limb being placed at rest. If the invasion is along the lymphatics of the upper extremity it is well to surround the arm above the highest point of inflammation with a circular blister, one inch in width. In the treatment of Erysipelas the use of mercurial ointment is advised by Velpeau and Ricord and others, although it may be questioned if it possesses advantages over other more cleanly applications that are advised. Mercurial ointment, or a combination of it with belladonna ointment, is valuable in absorbing indurations following an attack of Syphilitic Orchitis or Epididymitis. In Jaundice in the newborn baby R. A. F. Penrose advises the use of the ointment spread on the roller which is worn next to the skin. In Adenitis mercurial ointment has been used with a fair amount of success, but, on the whole, may be considered less efficient than are the preparations of iodine.

Diseases of the Skin.—Metallic mercury is employed in the treatment of skin diseases under the form of the well-known unguentum hydrargyri. This preparation is employed in the treatment of Infantile Syphilis. A piece the size of a large hickory nut is spread upon a flannel belly-band, and renewed daily until the band becomes stiff, when a new one is employed. This is readily absorbed and affords a convenient method of introducing mercury into the system without interfering with the digestion.

In palmar and plantar syphilis the following plaster is useful: ℞. Hydrarg. gr. c; terebinth., gr. c; emplast. plumbi, gr. ccl; resini pini, gr. l. M. It is very tenacious, and when applied should be kept in contact with the thickened skin as long as it will adhere.

Diseases of the Chest.—Stristower (*Berl. Klin. Wochensch.*, 1891, No. 22) claims that inunction on the chest walls in Pulmonary Phthisis is followed by remarkable diminution in the bacilli of the sputum, while the general condition of the patient improves.

HYDRARGYRUM AMMONIATUM. Ammoniated Mercury. White Precipitate. Mercurammonium Chloride.

Ammoniated mercury is composed of "white, pulverulent pieces, or a white powder, permanent in the air, odorless and tasteless, and insoluble in water or alcohol." (U. S. P.) An ointment (Unguentum Hydrargyri Ammoniati), containing ten parts of ammoniated mercury in one hundred parts of the ointment, is official.

Ammoniated mercury is discutient, stimulant, and parasiticide.

Diseases of the Skin.—Ammoniated mercury is employed in the form of an ointment. In the proportion of five to twenty grains to the ounce, it is a valuable application in Tinea Circinata and Tinea Tonsurans, also in Scaly Syphilitic Eruptions and in Psoriasis. In some conditions of Chronic Eczema the ointment of ammoniated mercury is of value.

The official ointment has always been made of an impracticable strength. It will rarely be possible to employ the drug in ointment of a greater strength than twenty grains to the ounce. A stronger form is apt to excite dermatitis, and even weaker ointments at times cause salivation if employed over too large a surface.

The ten- to twenty-grain ointment of ammoniated mercury is particularly useful in Psoriasis of the Scalp and Face, being one of the few efficient ointments which do not discolor the skin.

Diseases of the Ear and Nose.—Ammoniated mercury is used by Sexton for Chronic Eczema of the auricle. B. Robinson (*N. Y. Med. Journal*, September 29, 1887) employs the ointment with vaseline for a base in loosening crusts in Atrophic Rhinitis. It is of especial value in the treatment of Eczema of the Nostril.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO.

This plaster unites the stimulating and alterative properties of both drugs. It was at one time extensively employed in the later stages of Synovitis of the knee-joint, spread on leather and retained firmly by a bandage, the joint being fixed with a posterior splint. Since the introduction of mercurial and belladonna ointment, it is not so often employed as formerly, although it may be applied to a joint, and the entire articulation enveloped in a plaster-of-Paris bandage, which is left undisturbed for several weeks.

HYDRARGYRI NITRAS. Nitrate of Mercury.

The salt is obtained by concentrating and crystallizing the solution. It is rarely used. (For properties, *vide infra*.)

Diseases of the Nose, Throat, etc.—J. S. Cohen recommends the use of nitrate of mercury (one part to ten of water) as a topical application to the vocal cords in CHRONIC LARYNGITIS. The same writer refers to a local treatment of FŒTID CORYZA, by applying a solution of fifteen grains of the drug with fifteen drops of fuming nitric acid in about six drachms of warm water.

LIQUOR HYDRARGYRI NITRATIS. Solution of Nitrate of Mercury. Solution of Mercuric Nitrate. Solution of Pernitrate of Mercury.

"A liquid containing about fifty per cent. of mercuric nitrate with some free nitric acid." (U. S. P.) It is made by dissolving forty parts of red oxide of mercury in forty-five parts of nitric acid and fifteen parts of water.

Acid nitrate of mercury is an active caustic.

General Surgery.—Acid nitrate of mercury was at one time generally used for the cauterization of VENEREAL SORES. It is now, in the main, restricted to the treatment of PHAGEDÆNIC ULCERATIONS. It is also recommended in the treatment of NOMA, especially in children the subject of SYPHILIS. Its employment is not unattended with danger, as it has been known to produce salivation. A case is recorded (*Lancet*, January 3, 1874) in which severe toxic symptoms followed the application to a surface less than two inches in diameter. In ULCERATION OF THE CERVIX UTERI, especially when depending on any venereal condition, an application of the acid nitrate will be found a prompt and reliable agent. West states that he has used the acid nitrate with benefit on OBSTINATE SIMPLE ULCERATION OF THE OS UTERI when covered with fungous granulations. Care must be exercised, however, in the application of such an agent to the uterus that portions of the vaginal canal do not come in contact with the solution; neither should it come in relation with the speculum except that it be made of glass or rubber. After applications of the drug to the uterus it is best to have a small compress of cotton saturated with oil to neutralize excess, or a tampon of cotton saturated with black wash or carbolized oil. As a rule, the applications are not painful.

Diseases of the Skin.—Nitrate of mercury is usually employed in the form of the liquor hydrargyri nitratis. (U. S. P.) It can be applied on a bit of stick wrapped around with absorbent cotton, which can be thrown away after use. It is employed in the treatment of ACNE, small MOLES, and NÆVI, ROSACEA, and, in a more or less diluted form, in SCROFULOUS ULCERS, CONDYLOMATA, and MUCOUS PATCHES.

Diseases of the Ear, Nose, and Throat.—The acid nitrate of mercury is recommended by Roosa for the destruction of AURAL POLYPI.

It serves an admirable purpose in the treatment of SYPHILITIC ULCERATION OF THE NASAL SEPTUM. S. Johnston recommends one part of this agent to eight of water as an application to SYPHILITIC ULCERS OF THE PHARYNX. The drug can be used pure or in proportion of one part to five of water, as an application to SYPHILITIC LARYNGITIS. It has been used with success in proportion as strong as one to three, or as weak as one to ten, in making applications to the lining membrane of the ventricle of the LARYNX after the removal of epitheliomatous outgrowths.

UNGUENTUM HYDRARGYRI NITRATIS. Citrine Ointment.

Citrine ointment is regarded by many of the older surgeons as a valuable stimulating ointment. By keeping long it decomposes, changes its color, and becomes irritating, so that it should be used only when freshly made. It may be diluted to any extent with lard. It can be used in the treatment of INDOLENT ULCERS FOLLOWING BURNS. It has been employed with considerable success in the abortive treatment of WHITLOW or other inflammatory conditions involving the fingers. The method is to cover the finger with the ointment one-eighth of an inch thick. Over this is placed a broad strip of adhesive plaster. The dressing may remain for twenty-four hours, after which time no further treatment is necessary. (*Med. and Surg. Reporter*, April 14, 1888.)

Diseases of the Skin.—Citrine ointment, more or less diluted, forms an admirable stimulant application in CHRONIC ECZEMA and other localized skin affections.

OLEATUM HYDRARGYRUM. Oleate of Mercury.

Oleate of mercury was introduced by Marshall as a substitute for mercurial ointment, which it closely resembles. Ten parts of the yellow oxide of mercury are added in sufficient oleic acid to make one hundred parts. As a pharmaceutical product it is superior to the mercurial ointment. To obtain a satisfactory and stable preparation it is important that a pure oleic acid should be employed, otherwise decomposition will take place and metallic mercury form at the bottom of the vessel containing it.

General Surgery.—Oleate of mercury has been especially commended in CHRONICALLY INFLAMED JOINTS, and in INFLAMMATORY INDU-

RATIONS. It is more irritating than blue ointment and is, therefore, usually combined with morphine in the proportion of a grain to the drachm.

The oleate of mercury is commonly employed as a substitute for mercurial ointment on account of its greater cleanliness. It forms an excellent method for the constitutional treatment of SYPHILIS by inunction. It is also a reliable parasiticide, particularly in TINEA TONSURANS.

In BROMIDROSIS of the axillæ a few applications of a ten per cent. oleate of mercury ointment to the skin previously cleansed with alcohol is often of benefit.

HYDRARGYRI SALICYLAS. Salicylate of Mercury.

Mercuric salicylate is prepared by mixing solutions of mercuric sulphate and barium salicylate. The resulting precipitate of salicylate of mercury is a fine, white, insoluble powder, without odor or taste. It forms soluble double salts with the chlorides, bromides, and iodides of sodium or potassium.

Diseases of the Skin.—The salicylate of mercury has recently been employed in the treatment of SYPHILITIC ULCERS. A lotion of five grains each salicylate of mercury and carbonate of potassium to the ounce of distilled water and an ointment of sixteen grains of the mercurial salt to the ounce of vaseline are recommended.

MERCURIAL BATH.

The mercurial vapor may be generated from metallic mercury, calomel, mercury with chalk, the bisulphuret, the gray oxide, or the binoxide, from a scruple to three drachms of which are required for each bath, the quantity being proportioned to the effect desired. (Bumstead and Taylor, "Venereal Diseases.")

Taylor prefers calomel (*q. v.*), which should be perfectly pure. An apparatus should be employed by which watery vapor is first disengaged, and later the mercurial vapor. The treatment is of advantage in extensive pustular or crusted SYPHILODERMATA, but owing to the inconvenience attending its use it has not been extensively employed.

An apparent exception to the rule of non-absorption of salts in watery solution is found to obtain in the case of infants treated for HEREDITARY SYPHILIS by baths of corrosive sublimate. The child is placed in an ordinary wash-tub of water in which ten grains of corrosive sublimate have been dissolved. A sufficient quantity will be absorbed, after several such baths have been taken on successive days, to influence the system in a manner favorable to recovery. (For accounts of Baths see *Appendix.*)

HYDRASTIS. Hydrastis. Golden Seal.

Hydrastis is "the rhizome and rootlets of *Hydrastis canadensis.*" (U. S. P.) The drug contains three alkaloids, hydrastine, berberine and canadine. "Hydrastine crystallizes in brilliant, one-sided prisms, which are white or colorless when pure, inodorous and almost tasteless in consequence of their insolubility in the saliva, but which become bitter and somewhat acrid in saline combination. It is nearly insoluble in water, but is readily dissolved by alcohol, ether, chloroform, and benzol. It has an alkaline reaction and forms salts with acids, most of which are readily soluble in water." (U. S. D.)

Berberine, to which hydrastis owes its yellow color, is in the form of a yellow powder, having a bitter taste, soluble in about a hundred parts of cold water, less soluble in cold alcohol, freely soluble in both hot alcohol and hot water, and not at all soluble in ether. It forms sparingly soluble salts with hydrochloric and sulphuric acid, and a freely soluble salt with acetic acid. The hydrochloride is the salt most used. *Canadine* occurs in white needles; the sulphate is the most desirable salt. A resinous substance obtained by treating an infusion with hydrochloric acid is sometimes sold under the name of *hydrastin*. It is a mixture containing resin, hydrastine, and berberine, and because of the uncertainty of its composition should not be used.

General Surgery.—Much of the virtue of this drug is probably due to berberine. The fluid extract has been used locally in FISSURE OF THE ANUS and in ULCERATED CONDITIONS OF THE RECTUM. It has also been used in LEUCORRHŒA and VAGINAL and UTERINE ULCERATIONS. The hydrochloride of hydrastine apparently possesses virtues similar to those of ergot. It is used hypodermically in five and ten per cent. solutions. The injections are said neither to cause pain nor discoloration of the tissues. Falk has reported twenty-six cases where he has employed it in this manner with more satisfactory results than with ergotine.

Diseases of the Nose, Throat, Mouth, etc.—Hydrastis has had for a long time a reputation in domestic medicine in relieving excited states of the mucous membranes. Hence, the suggestion has been made that its properties may be useful in the local treatment of CATARRH of the upper respiratory tract. The fluid extract is bitter and not free from irritating properties. A solution of hydrochloride of hydrastine in the proportion of twenty grains to a pint of water forms a preparation of which one-third diluted with two-thirds of water can be used locally upon the affected parts.

Leffmann (*Amer. Sys. of Dentistry*, p. 726) claims that hydrastis is antiseptic in proportion of one drachm of the tincture to an ounce of water. It is found to be a useful application in all INDOLENT and OFFENSIVE ULCERATION OF THE MOUTH AND THROAT.

Potter ("Therapeutics") and S. H. Chapman recommend hydrastis in the local treatment of SUBACUTE NASAL CATARRH. A drachm of the fluid extract may be added to eight ounces of water and used as a lotion.

Hydrastis is mentioned by manufacturers of chemical preparations for the trade to be of value when used either locally or generally. It enters into the composition of nasal bougies, each bougie containing five minims of the fluid extract; yet many practitioners are skeptical as to its value. According to E. L. Shurly (*N. Y. Med. Journal*, September 11, 1886), it is worthless.

Diseases of the Eye.—Hydrastine has been recommended as a stimulant in sluggish forms of CHRONIC CONJUNCTIVITIS, but has not been much used. A solution of four or five grains to the ounce is applied to the everted lids.

HYDROGENII PEROXIDUM. Hydrogen Dioxide. Peroxide of Hydrogen. Solution of Peroxide of Hydrogen. Solution of Hydroxyl.

Peroxide of hydrogen is usually made by decomposition of hydrated peroxide of barium by sulphuric acid. For use in the field E. R. Squibb & Sons prepare materials for the extemporaneous preparation of the solution. A mixture of barium dioxide and of phosphoric acid is made. To remove the small proportion of barium (probably in the condition of an acid phosphate of barium) a small quantity of dilute sulphuric acid is added. Peroxide of hydrogen is employed in the arts for bleaching, and is the substance which, under various names, is sold for bleaching the hair. It must, therefore, be employed with caution in surgical applications to the head and face. It should be remembered that it effervesces not only with pus, but with blood and serum.

The preparation furnished is a ten- or fifteen-volume solution, that is to say, about three per cent. aqueous solution H_2O_2.* This is, however, apt to contain a proportion of hydrochloric acid, so that it should be further diluted with one or two parts water. (S. Solis-Cohen, *N. Y. Med. Journal*, March 6, 1886.)

Peroxide of hydrogen is unstable. It should be kept in a cool, dark place, and it is better for the bottles to be small, so that what is not used may not be exposed to the atmosphere.

"Solutions should be kept loosely corked so that the oxygen of decomposition may leak out, or the cork be easily blown out, because in this way the risk of dangerous explosion is avoided, whilst the decomposition is not retarded by keeping the oxygen in." (Circular of Squibb & Sons.)

Peroxide of hydrogen is antiseptic,† slightly stimulating, and, by virtue of its remarkable property of effervescing in the presence of pus, mucus, cerumen, and blood, cleanses diseased surfaces while exerting no injurious effect upon the cells. By removing enveloping fluids and septic clots, it enables the physician to make subsequent applications of other drugs. Miguel, indeed, places peroxide of hydrogen at the head of the list of antiseptic agents. The following table shows the relative strengths of the four most powerful germicides:—

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* This preparation appears to be sold entirely on the amount of available oxygen—that is, the volume of free oxygen which a volume of the solution will yield. A fifteen volume solution will yield fifteen volumes of oxygen. As the commercial article rarely if ever yields over ten volumes of oxygen, it is safe to use it of full strength, notwithstanding the fact that the manufacturers claim their product to yield full fifteen volumes. The term per cent. has come to be used instead of volume, and very improperly. There can be no such thing as a ten per cent. solution of hydrogen peroxide. *Volume* is always intended. The per cent. is rarely above two or three.

† In this connection see P. Gabier ("Trans. Internat Med. Congress," Berlin, 1890.)

Biniodide of mercury,	0.025
Biniodide of silver,	0.03
Hydrogen dioxide,	0.05
Bichloride of mercury,	0.07

Judging from the writings of enthusiastic observers, some of the results claimed may mislead; nevertheless, if the drug be used with intelligence, it is an excellent remedy. B. W. Richardson, who introduced the agent into practice (*Asclepiad*, January, 1891), found that to venous blood deprived of fibrin it imparts oxygen. Fibrin and cellular tissues cause it to evolve oxygen; sugar and starch are decomposed. Albumin, gelatin, urea, have no effect on it.

General Surgery.—Peroxide of hydrogen may be applied either by means of an atomizer, syringe, or a small swab of clean, absorbent cotton on a splinter of wood, according to circumstances. The uses to which it may be put are numerous in the treatment of wounds.

Peroxide of hydrogen is especially efficacious in the removal from granulating surfaces of small superficial sloughs (which cause the lesion to exhibit a dull gray appearance) seen in CHRONIC LEG ULCERS, INDOLENT SUPPURATING BUBOES, and in FISTULOUS TRACTS. Owing to its non-irritating properties, it may be employed with advantage in the cleansing of large articular cavities. In EMPYEMA it especially recommends itself in preference to other antiseptics for washing out the affected cavity. In abdominal surgery, especially when connected with either inflammatory or septic collections of matter, it is efficient. The wound should be injected with the pure solution, or diluted one-half with distilled water. After cleansing, the cavity may be packed with gauze saturated with the solution and dressed after the usual antiseptic method. C. Noble commends the peroxide of hydrogen for cleansing the hands preparatory to abdominal operations, especially when the skin about the finger nails has become horny or rough from too frequent washing or from prolonged contact with antiseptic solutions. In CYSTITIS, where pus is voided with the urine, peroxide of hydrogen may be employed as an irrigating solution in strength of two ounces of the fifteen volume solution to a pint of distilled water. Great care must be exercised not to over-distend the bladder. Peroxide of hydrogen has been employed as an injection in GONORRHŒA, but the results obtained have not been satisfactory, as reports would lead one to believe. It will be found of service in the cleansing and treating of VENEREAL SORES, as CHANCROIDS, etc. In PUERPERAL SEPTIC ENDOMETRITIS Grandin speaks highly of peroxide of hydrogen for flushing the uterus after it has been curetted.

Diseases of the Skin.—Peroxide of hydrogen has a limited field of employment. Applied to FOUL and TORPID ULCERS it freshens the surface, and stimulates granulations; it has likewise been employed for the removal of discoloration of the skin, as CHLOASMA.

Diseases of the Ear, Nose, Throat, etc.—The fifteen-volume solution is generally diluted about one-fourth for the throat, nose, or pharynx. It can be directed in full strength in dissolving CERUMEN, and with care the commercial solution can be applied to the tonsils.

It is of especial value in cleansing the middle ear, notably the tympanic, attic, and external auditory passage. A six per cent. solution may be used as a convenient strength in the beginning of the treatment. The solution can be gradually increased. (W. A. Dayton, *Arch. of Otology*, vol. XIV, 1885.) The tonsil, the thicker tissue over the middle turbinated bone, the surface of a syphilitic ulcer, are often covered with tenacious mucoid masses, which render ineffective local medication of the diseased structures. Such exudates can be easily removed by the peroxide. The agent has less influence on the deposits of tonsillitis than on other forms. W. C. Glasgow (*Trans. Am. Laryng. Ass'n*, 1889) uses peroxide of hydrogen as a spray on the deposits of DIPHTHERIA. It is of great value in the laryngeal form of the disease. In Philadelphia the employment of the peroxide as thus indicated is in accordance with the practice of most physicians.

W. C. Phillips (*Med. Record*, April 11, 1891, 423) claims that this agent has hæmostatic qualities and is indicated after intra-nasal operations. The undiluted solution should be sprayed in the nose, where it will mix with the blood and form a firm clot, when HEMORRHAGE is arrested by pressure.

Diseases of the Eye.—Landolt (*Archives d'Ophthalmol.*, 2, 385) considers the peroxide of hydrogen a powerful antiseptic and a remedy of great value in ocular therapeutics. He claims that it promptly arrests suppuration and seems to deprive it of its septic character, while it is better borne by the cornea and conjunctiva than any official germicide. He recommends it particularly in PURULENT OPHTHALMIA, DIPHTHERITIC CONJUNCTIVITIS, SLOUGHING ULCERS OF THE CORNEA, and SUPPURATION OF THE LACHRYMAL PASSAGES. He uses a three per cent. solution (three per cent. by weight, about equal to the fifteen-volume solution in common use), which may be employed with safety; concentrated solutions* may cause haziness of the cornea. In PURULENT OPHTHALMIA a few drops are instilled in the conjunctival sac four or five times a day. In SLOUGHING KERATITIS Landolt aids the separation of the slough, after applying the peroxide, by gentle friction with the lid. In SUPPURATION OF THE LACHRYMAL PASSAGES the solution is forced through them by means of the small lachrymal syringe.

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* At the Will's Hospital, Philadelphia, a 50 per cent. strength of the fifteen-volume solution is used.

Other observers have made similar claims for this drug, but it has not yet passed the experimental stage, and something must be allowed for the enthusiasm for new remedies.

HYDROXYLAMINE HYDROCHLORIDE.

The base, hydroxylamine, of this crystalline salt is only known in solution, and differs from ammonium hydrate by two hydrogen atoms. Ammonium hydrate has the formula NH_4OH, and hydroxylamine NH_2OH. The hydrochloride, $NH_2OH.HCl$, appears to be the only form in which it is used medicinally.

It occurs in colorless crystals, which readily absorb moisture from the air. It is soluble in an equal weight of water, in fifteen parts of alcohol, and readily soluble in glycerin. In many respects it resembles ammonium chloride, from which it is distinguished by forming a clear solution with twenty parts of absolute alcohol, while the ammonium chloride is sparingly soluble in that liquid.

Hydroxylamine hydrochloride is parasiticide and excitant.

Diseases of the Skin.—Hydroxylamine was introduced by Eichoff (*Monatsh. f. Prakt. Dermatol.*, January 1, 1889) as a "reducing agent." He considers it a valuable remedy in the vegetable parasitic diseases of the skin, TINEA CIRCINATA, TINEA TONSURANS, TINEA FAVOSA, and TINEA VERSICOLOR.

After washing the affected parts with soap and water, these are painted thrice daily with the following pigment: ℞. Hydroxylamin. hydrochloridi, gr. j; alcoholis, glycerinæ, āā f℥j. M.

Binz agrees with Eichoff in recommending this remedy, and asserts it to be a substitute for chrysarobin. He uses it in LUPUS, PSORIASIS, and PARASITIC SYCOSIS. Fabry also recommends it, while Groddeck (*Monatshefte f. Prakt. Dermatol.*, 1890, p. 162) regards it as useless and dangerous.

HYOSCYAMUS.

"Hyoscyamus is composed of the leaves of *Hyoscyamus niger*, collected from plants of two years' growth." (U. S. P.) The leaves contain two alkaloids—hyoscyamine and hyoscyine. "Hyoscyamine crystallizes in colorless, transparent, silky needles, is inodorous, of an acrid, disagreeable taste, slightly soluble in water, and very soluble in alcohol and ether." (U. S. D.) The salts—sulphate, hydrobromide, etc.—are freely soluble in water. Hyoscyine is usually employed in the form of the hydrobromide, which is freely soluble in water. (See *Belladonna*.)

Hyoscyamus is sedative.

General Surgery.—Hyoscyamus is employed locally in surgery for the same purposes as is belladonna. It is used in the form of a suppository combined with opium in the treatment of CYSTITIS, to relieve both the pain and spasm of the bladder. In Europe, where the fresh leaves are readily obtained, hyoscyamus is often applied in the form of a lotion or fomentation, for the relief of painful HEMORRHOIDS, GLANDULAR ENLARGEMENTS, RHEUMATIC SWELLINGS, and NERVOUS HEADACHE. The drug has long possessed a reputation in the treatment of neuralgic affections, but, as a rule, more prompt and active results can be obtained from belladonna.

HYOSCYAMINE.

Diseases of the Eye.—The effects of hyoscyamine upon the eye are practically the same as those of duboisine. Indeed, some good authorities consider these alkaloids to be in all respects identical, while others, admitting their chemical identity, still claim that there are differences in their therapeutic action. Hyoscyamine has been said to be less likely to cause unpleasant constitutional effects, when used as a mydriatic, than duboisine, but as it has not been so extensively employed as the latter, this question cannot be considered decided.

HYDRIODATE OF HYOSCINE.

The hydriodate of hyoscine is the most powerful of the mydriatics, but is comparatively little used in ophthalmic surgery, because of its activity as a poison. A half per cent. solution applied to the conjunctiva is said to be liable to cause toxic symptoms, but this proportion has been frequently used in the Wills Eye Hospital without unpleasant effects. It is claimed for it that it will sometimes relieve IRITIC and CYCLITIC PAIN when the other mydriatics have failed. It is used in solutions of from one-half grain to two grains to the ounce.

Diseases of the Throat, etc.—Preparations of hyoscyamus may be substituted for those of opium for the relief of pain in CHRONIC LARYNGITIS. It forms a constituent of an anodyne lozenge.

Hyoscyamus is one of the ingredients of baume tranquille.

ICHTHYOCOLLA. Isinglass.

The swimming bladder of *Acipenser huso*, Linnæus, and of other species of *Acipenser*.

In separate sheets, sometimes rolled, of a horny or pearly appearance; whitish or yellowish, semi-transparent, iridescent, inodorous, insipid; almost entirely soluble in boiling water and in boiling diluted alcohol.

The solution in twenty-four parts of boiling water forms, on cooling, a transparent jelly.

Emplastrum Ichthyocollæ is the single official preparation.

Isinglass is demulcent and protective.

General Surgery.—Emplastrum Ichthyocollæ. Isinglass Plaster. Court Plaster. Besides forming a protectant for recent cuts and abrasions, isinglass plaster may be employed to hold the edges of wounds together when the parts have been thoroughly cleaned and adjusted. It should be used fresh, as it dries and cracks very quickly on exposure. An air-tight box is useful to preserve it. The application of a little glycerin and water will often improve an old piece. "Mechanics' Arnica Plaster" is an isinglass plaster spread on thin kid. It is about the only plaster that deserves the name of "waterproof." If well applied, it will keep its place in spite of moderate washing with warm water, soap, and a nail-brush. After washing, the edges are loosened and may be clipped off. The rest, with a little care, can be utilized for some time. With each washing a little of the plaster is sacrificed; but it will be some time before the last of it is lost. It is valuable in the treatment of CHAPPED KNUCKLES and RHAGADES.

ICHTHYOL. Ichthyol-sulphonate of ammonium.

Ichthyol is the trade name given to various salts of sulph-ichthyolic acid.

"In the dry distillation of a bituminous mineral containing fossil fish a tarry product is obtained. On treating this with sulphuric acid, and subsequently neutralizing with sodium or ammonium carbonate, ichthyol is obtained. This is a red-brown, syrupy liquid, of a bituminous odor and taste. Water or a mixture of equal volumes of alcohol and ether dissolves it to form a clear, red-brown liquid of a faintly acid reaction. Pure alcohol or ether dissolves it only partially; petroleum benzin takes up only a small quantity. It unites with fat and vaseline in all proportions." (U. S. D.) It contains about fifteen per cent. of sulphur.*

In a case reported by Bergeris a toxic impression from ichthyol ensued upon its use in the form of an intra-uterine injection. After remaining in collapse for twelve hours the patient recovered. (See *Thiol.*)

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* While this book was going through the press a monograph by Fessler ("Die Wirkung Ichthyols bei Erysipel und vorwandten Krankheiten," München, 1892) was received. The following abstract from this important study is herewith appended to the above account:

"From the distillation of a bituminous shale found in the Tyrol, and which is chiefly composed of the remains of fossil fishes, a mineral oil is obtained containing a high percentage of sulphur. This oil is transparent, of a brownish-yellow color, with a sea-green fluorescence. It has a specific gravity of 0.865, and boils at a temperature of 100 to 225° C. Analysis shows it to contain 77.25 per cent. carbon, 10.52 per cent. hydrogen, 10.72 per cent. sulphur, and 1.10 per cent. nitrogen. The sulphur is intimately combined with the oil. By treatment of this oil with concentrated sulphuric acid a certain quantity of sulphur and oxygen becomes combined with it, and thus sulph-ichthyolic acid results. This substance is soluble in water, of a greenish-black color and strong odor, and a syrupy, stringy consistence. It combines with sodium, potassium and ammonium."

Ichthyol is sedative, ischæmic, parasiticide, and probably disinfectant. Its use is especially indicated in superficial diffuse inflammations of low type. An elaborate statement of the properties of ichthyol can be found in *Merck's Bulletin*, January, 1892, p. 41. (See also *Unna*, *Monatschr. f. prakt. Dermatolog.*, v, 1886.)

General Surgery.—When applied freely to the skin in a pure form, ichthyol produces a slight irritation and sense of burning. It is asserted to possess peculiar alterative properties, and also the power of penetrating the skin and affecting the deeper tissues beneath, particularly the parenchymata of glands. Excellent results are obtained from ichthyol in the treatment of ERYSIPELAS. Von Nussbaum commends the following plan: Take of ichthyol and lanolin equal parts and spread over the affected surface. The surface is then enveloped in salicylated cotton. The progress of the disease is arrested and the pain lessened. Bitieff (*Rev. de Therap.*, April 1, 1888) uses ichthyol as a pigment, combined with collodion, as follows: Take of collodion fifteen parts, ether and ichthyol each one part.

In employing ichthyol in erysipelas, the affected part should be cleansed with soap and water, and then washed with a 1–1000 solution of bichloride of mercury. The ichthyol, pure or diluted with vaseline or lanolin, should then be spread thickly over the affected part, and covered with cotton batting.

Ulrich (quoted in *Lancet*, November 1, 1890) has tested the relative merits of the treatment by means of ice compresses, painting with tar, and with a solution of ichthyol, ether, and collodion painted on the affected surfaces. The mean duration of the disease under ichthyol was 6.8 days, while under the ice and tar methods it was 8.3 and 9.3 respectively. The relapses were less numerous under the ichthyol treatment.

In ERYSIPELAS Unna has obtained very satisfactory results from the use of an ointment of equal parts of ichthyol and vaseline. A pigment of the following composition has likewise been found useful: ℞. Ichthyollis, ætheris, āā fʒss; collodii, f℥j. M.

D. H. Agnew used ichthyol with great advantage in a fifty per cent. ointment in the treatment of LYMPHATIC ENLARGEMENTS; thoroughly rub into the affected parts,—the ointment to be kept in contact, spread on lint. It is also useful in SYNOVIAL INFLAMMATIONS, either involving the articulations or the sheaths of the tendons. The articulation is immobilized by means of a splint, the ointment consisting of equal parts of ichthyol and lanolin, spread upon lint and laid over the affected joint, covered with oil-silk and retained by means of a firm bandage.

Freund (*L'Union Médicale*) strongly advises ichthyol in the treatment of all INFLAMMATORY CONDITIONS OF THE FEMALE GENITAL ORGANS, applied in the form of an ointment.

It must be borne in mind that ichthyol is recommended in many conditions in which, before its introduction, preparations of iodine, mercury, etc., were indicated.

Diseases of the Skin.—The ichthyol-sulphonate of ammonia was introduced into medical use by Unna. It has been found of use in the treatment of a number of skin diseases, sometimes appearing to exert a disinfectant or parasitic effect.

In certain forms of ACNE ROSACEA, when there is a hard, knotty acne on a dusky bluish-red and swollen base, with thick epidermis and little pus-formation, where there are few comedones and considerable venous enlargement, a strong preparation of ichthyol (twenty grains to a drachm suspended in an ounce of water, or mixed with an ounce of vaseline) may be applied once or twice daily with good effect. The ichthyol soap, mentioned under the head of soaps may also be used in these cases.

When the rosacea is of a non-erythematous type, ichthyol can only be employed in a much more dilute form.

In ACNE with COMEDONES, we have sometimes used a lotion or emulsion of three or four grains of ichthyol suspended in an ounce of water, and applied at night with good effect. It produces a slight discoloration of the skin, however, and in some cases adds markedly to the disfigurement by intensifying the color and accentuating the presence of the comedones.

In some cases of SQUAMOUS and VESICULAR ECZEMA, with unbroken skin, very dilute lotions and ointments of ichthyol are said to be useful.

In PITYRIASIS OF THE SCALP stronger ichthyol ointments and lotions are employed.

Ichthyol has been directed in the local treatment of PSORIASIS, but we have found it much less effectual than other remedies in this disease.

In PARONYCHIA and in CONTUSIONS Lorenz employs ichthyol pure or with an equal quantity of water with excellent effect. He asserts that it prevents discoloration in the latter condition.

In ULCERS, particularly VARICOSE ULCERS OF THE LEG, Unna finds ichthyol of use, but we have failed to get satisfactory results in the cases in which it was prescribed.

A similar pigment has been used successfully to prevent the pitting of VARIOLA; acts favorably in FURUNCLE.

In PRURITUS VULVÆ, particularly when connected with vulvitis, a lotion of one drachm of ichthyol to the ounce of water is said to be of service.

Of late certain ichthyol "varnishes" have been brought forward as affording an easy and efficacious method of applying the remedy.

The pure drug, apart from its unsightliness and objectionable odor, will not dry even if spread in a thin layer, but remains for hours moist and sticky. Ichthyol-collodion promised better, but the irritation which is caused by removing it is such as to more than counterbalance its beneficial effects.

To attain the desired end, Unna suggests the following: ℞. Ichthyolli, ℈iv; amyli, ℈iv; sol. albumin concent., ♏v–viij; aquæ ad f℥j. M.

The starch is first moistened with the water, the ichthyol is then well rubbed in, and finally the albumin is added.

This preparation dries quickly and new coats can be added. It is useful in IRRITABLE ACNE, ROSACEA, SEBORRHŒA, LUPUS ERYTHEMATOSUS, ECZEMA ERYTHEMATOSUM, and ERYSIPELAS.

The parasiticide effects of ichthyol upon the streptococcus of ERYSIPELAS, and also upon the staphylococcus pyogenes met with in FURUNCLE, ACNE, IMPETIGO, etc., have been proved by Fissler in a series of carefully conducted experiments.

Diseases of the Ear, Nose, etc.—Ichthyol possesses marked advantage in the treatment of diffuse inflammation of the external auditory meatus and auricle. A twenty per cent. strength with cosmoline base is admirable in ULCERATION OF THE SEPTUM and of FISSURE AT THE EDGES OF THE NOSTRIL. In the proportion of one grain to six ounces of lime water ichthyol has been recommended in the treatment of PURULENT RHINITIS.

IODOFORMUM. Iodoform.

Iodoform is a product of the action of iodine on a mixture of alcohol and a solution of carbonate of potassium. (Ph. Br.) Iodoform is a light-yellow, flocculent powder, having a peculiar, penetrating, disagreeable odor. It is practically insoluble in water; is "soluble in eighty parts of alcohol at 15° C. (59° F.), in twelve parts of boiling alcohol, in five and two-tenths parts of ether, and in chloroform, benzol, benzin, bisulphide of carbon, and in fixed or volatile oils." (U. S. P.) It is usually employed in the condition of a powder, sometimes, however, in solution in ether or collodion. Iodoform collodion solution contains five per cent. of iodoform.

Iodoform cotton is prepared by steeping absorbent cotton in a seven and a half per cent. solution of iodoform.

It is claimed that iodine is set free from iodoform when it is applied to a moist surface, and that upon this property the efficacy of the agent depends.

Iodoform is protectant, analgesic, alterative, and, to at least some forms of bacilli, germicide.

Iodoform was introduced to the profession by Bouchardat (*Manuel de Matière Med.*, Paris, 1856).

Agents which have been Recommended to Cover the Odor of Iodoform.—Among the statements made in this connection may be included the following: Ehrmann (*Brit. Med. Journ.*, September 29, 1888) recommends an admixture of tar with iodoform, and it is said the result gives a spicy odor, resembling neither ingredient. This, it is claimed, may be further disguised by the addition to the powder of liquid styrax. Oppler (*Revue de Thérapeutique*, December 15, 1885) adds one part of copper sulphate to two of iodoform. Gillette (*Revue de Thérapeutique*, December 15, 1885) to one hundred parts of iodoform combines one of sulphate of quinine and three of powdered wood charcoal. Cantrelle (*Med. News*, May 18, 1889) uses with every fifteen grains of iodoform three-fourths of a grain of menthol and one drop of essence of lavender. Jaksch (*Wiener Med. Presse*, No. 142, 1888) recommends a two per cent. admixture of creolin with iodoform. Among other agents may be mentioned ground coffee, balsam of Peru, oil of bitter almond, oil of cade, thymol, coumarin, attar of rose, oil of bergamot, and oil of coriander; of the agent last named eight drops may be added to a drachm of the drug. A serious objection to the use of many of the deodorants could be found in the addition of a septic material to one assumedly sterile.

The Toxic Impression of Iodoform.—Numerous instances are on record of the toxic effect being produced by the local application of the drug. It appears to be more quickly absorbed than are other forms of iodine preparations. If a disposition to toxic effect from a moderate quantity be obtained, iodoform should be abandoned.

Iodoform is with some individuals irritative to the skin, and may excite dermatitis.

As an example of suddenly induced iodoform intoxication, the following account is inserted at this place. Schuster (*Berliner Klin. Wochen.*, No. 20, May 15, 1882) took twenty deep inhalations from a glass tube open at both ends, in which a quantity of iodoform was held between two pieces of cotton; suddenly a violent pressure was felt in the region of the forehead, as though the experimenter had been struck from without. All objects appeared to be of a black color; great mental uneasiness and anxiety ensued. The effect gradually passed off, leaving no sequelæ.

Doubtless many subjects have succumbed to the poisonous effects of iodoform, and have been regarded as dying of the affection for which the drug was exhibited. Notably has this been so in the case of the aged. Willimar (*Centralblatt für Chirurgie*, No. 50, 1886) found that out of seventy-nine cases of poisoning, fifty per cent. occurred in persons between sixty and seventy years old, and twenty-one per cent. in cases over seventy years of age. The very young are also susceptible to the toxic impression.

According to Treves (*Practitioner*, October, 1886) the conditions favorable for poisoning are clean, granulating wounds or burns, abscess cavities, fistulæ, and sinuses; cases in which the powder is applied under pressure or covered with impermeable dressings, as well as in instances in which the drug comes in contact with mucous surfaces, as may occur after dressing the wound in colotomy. The symptoms of poisoning may appear shortly after the application of the powder, or be deferred for days or weeks. Two forms of poisoning occur, the acute and the chronic.

In the *acute* form the symptoms are violent and generally develop suddenly. Vertigo, headache, sleeplessness, and delirium follow. The temperature rises, the pulse ranges from 150 to 180 in the minute, vomiting and even mania ensue. The patient wastes, and may die in a state of exhaustion, attended by coma.

In the *chronic* form, malaise, loss of strength, depression of spirits, slight fever, a rapid pulse, and headache are prominent symptoms. The patient becomes apathetic, melancholy, weak, and apprehensive. This train of symptoms may extend over a period of from a week to months before dissolution.

General Surgery.—The views held on the antiseptic value of iodoform have markedly changed in the past few years, owing to the results obtained by the experiments of Heyre and Roosing. (*Fortschrift für Medizin*, No. 2, 1887.) These writers demonstrated that not only is iodoform not germicidal, but that micrococci freely develop within it. Many observers, however, assert that when brought in contact with the free fluids of the body, an equable temperature of the body being preserved, free iodine, which is germicidal, is liberated.

Bruns ("Rept. XVI German Surg. Congress," in *Centralblatt für Chirurgie*, 1887, No. 25) has demonstrated the value of iodoform in the treatment of TUBERCULOSIS. It would appear as though it had a selective action on the characteristic bacillus. After its exhibition Nauwerck (*op. cit.*) demonstrated that the bacilli disappeared. The tubercular layer of the abscess wall became necrotic and in time was replaced by normal granulations. Nevertheless, the practice of treating wounds with iodoform, for the purpose of preventing bacterial invasion, is delusive.

In COLD ABSCESSES, especially those of tubercular origin, iodoform acts admirably. A preparation composed of iodoform one part and olive oil ten parts is recommended to be used as an injection. After a period varying from one to two months, the abscess gradually diminishes in size and finally disappears. The length of time required to accomplish a cure is frequently a cause of failure, since the surgeon, losing faith in the treatment, is disposed to abandon it before it has been fairly tried. In very large abscesses cure is exceptional before two to four months. In the last five years Bruns (*Arch. für Klin. Chirurg.*, Bd. XL, Heft. 4) has treated upward of a hundred cold abscesses by means of iodoform injection, and eighty per cent. have been cured. Since it has been claimed that relapse is common from apparent cure, the cases treated two or three years ago were again examined. In all the cure was permanent.

Excellent results have been obtained also by the use of iodoform injections in TUBERCULAR JOINT AFFECTIONS. Cures followed in many cases, according to the reports of Bruns, Wendelstadt, Krause, and Mosetig von Morrhof. For these injections a ten to twenty per cent. mixture of iodoform and olive oil, freshly prepared and sterilized, should be employed. This is never followed by sufficient absorption to occasion toxic symptoms. When the disease takes the form of PARENCHYMATOUS SYNOVITIS, with marked fungous outgrowth, the injection is thrown in the joint cavity and into the fungous masses by several punctures, from two to six cubic centimetres of the mixture being forcibly driven in. When there is effusion into the joint, or abscesses have formed after puncture and evacuation, a quantity of the mixture, sufficient to moderately fill the cavity, is injected, from ten to thirty cubic centimetres frequently being required. There is but slight reaction following the treatment, and fixation of the joint is not necessary. Parenchymatous injections are repeated at intervals of eight days; when cavities are treated, two to four weeks should elapse between each injection. Pain frequently disappears in a few weeks, but improvement in other respects is a matter of considerable time. The motion of the joint is often completely restored. More than half the cases thus treated may be expected to recover. In the treatment of LUPUS, Chicken (*Lancet*, April 23, 1887) and O'Neill (*Brit. Med. Jour.*, November 22, 1890) speak favorably of the use of iodoform. The ulcerations are first scraped with a blunt knife or spoon, and then rubbed well with an ointment composed of one part of the drug and seven parts of excipient.

Selitski (*Lancet*, July 3, 1886) and Koch (*Wiener Klin. Wochenschrift*, No. 27, 1889) have used ointment of iodoform in ERYSIPELAS. Not only was the affected part covered, but the healthy skin also, for a distance of two or three inches. After several applications, a fall of temperature took place, the disease was limited, the part gradually resumed its normal contour, and the skin its color.

It has been suggested to employ the drug suspended in collodion, a drachm to the ounce, and painted, over the affected skin.

Terrier (*Le Progress Médicale*, December 1, 1888) and Mosetig von Morrhof have reported good successes in PARENCHYMATOUS GOITRE from the injection of one to two grammes of a mixture of iodoform, one part, ether, five parts, and olive oil, nine parts; injections being practiced at intervals of from three to four days.

MALIGNANT PUSTULE has been successfully treated, according to Whitehead (*Brit. Med. Jour.*, March 2, 1889), Rinonapoli (*Bolletin della R. Accad. Med. ch. di Napoli*, No. 3, 1889) and others by the hypodermic injection of a ten per cent. ethereal solution into the base of the tumor. A severe burning sensation is experienced, which is, however, soon followed by permanent relief from suffering. In the course of a week the mass disappears, and all that remains is a dry, black slough, which can be readily removed.

In SUPPURATING BUBOES Pantain (*Journal of Cutaneous and Genito-Urinary Diseases*, 1889) has practiced the evacuation of the cavity through a very small incision, and the injecting through the opening, after the manner of the Viennese, an ethereal solution of iodoform, or the drug suspended in oil or melted vaseline. The opening is then plugged or covered with an impermeable dressing.

In CHANCRES, in CHANCROIDS, and in SYPHILITIC and all other ULCERATIONS, iodoform has been freely used either in the form of the dry powder, in pencils, in ointments, in ethereal solutions, or in oils and collodion. It is true that the treatment of ulcers by iodoform applications has been disappointing, and writers who believe in the curative powers of the drug under other conditions acknowledge that in the lesions named the constant exudation washes away the medicament. The fact, however, remains that few clinicians now use iodoform in open ulcerations.

Iodoform has also been largely used in BURNS (Rottenberg, *Therap. Monatshefte*, March, 1891); it is claimed that the pain is rapidly allayed, and that restitution of the part takes place at least as quickly as under the use of any other drug. It is used both in the form of a dusting powder and in a ten per cent. ointment. The claims of its curative powers in GONORRHŒA by Winternitz (*Med. Record*, December 26, 1883), Thiéry (*Le Progrès Médicale*, March 3, 1887) and others, have not been sustained. Bockhart (*Monatshefte f. prakt. Dermat.*, January, 1886) concludes, and with his opinion we concur, that iodoform is of no value in gonorrhœal affections. Chandelux (*Lyon Médicale*, June 5, 1887), Frey and Mosetig-Moorhof (*Centralbl. für Chirurgie*, August 18, 1889) speak highly of the use of iodoform in CYSTITIS. Owing to its analgesic and deodorant properties, they think it particularly suited to this affection; after the bladder is flushed with warm water, a tablespoonful of the following mixture in a pint of warm water is injected: Iodoform, 50 parts; glycerin, 40 parts; distilled water, 10 parts; tragacanth, ¼ part. The injection to be repeated every third day.

In VAGINAL and UTERINE ULCERATIONS iodoform has proved satisfactory to some observers. In UTERINE CANCER it is said to relieve pain, and in a measure to correct the fetor of the discharge. According to Schauta (*Lancet*, November 9, 1889) iodoform gauze has been used with good result in POST-PARTUM HEMORRHAGE. For tamponing the vagina, etc., iodoform cotton and gauze are still popular. Gersung (*Centralblatt f. Chirurgie*, July 30, 1887) uses for the drainage of wounds wicking impregnated with iodoform.

Diseases of the Skin.—On account of its odor iodoform is not often employed in the treatment of diseases of the skin other than those of a syphilitic character.

In ULCERATIVE SYPHILODERMATA, iodoform, placed in the carefully cleansed cavity of the ulcers, lessens pus-formation, and aids in the reparation of tissue.

In simple ULCERS of the lower extremity iodoform is often of great value. The ulcer, being thoroughly cleansed with antiseptic washes, is sprinkled thoroughly with iodoform and then covered with an occlusive dressing, which may remain in place some days,—a great advantage in patients treated outside of a hospital, as it allows the physician to keep the dressing under his own control.

In the APHTHOUS VULVITIS of children a small quantity of iodoform is dusted upon the parts with a camel's-hair pencil. The labiæ are then separated from one another by a bit of patent lint; rapid amelioration results.

It has also been used in PRURITUS VULVÆ, as a powder.

Iodoform sometimes gives rise to dermatitis, the extreme itching of which may be allayed by sponging with hot water, or, when possible, plunging the part into hot water for a few moments.

Iodoform is of service in the treatment of skin diseases, such as LUPUS, where the disease appears to depend upon, or to be constantly associated with, the presence of bacilli. (T. Lauder Brunton, "Modern Therapeutics," p. 74.)

Diseases of the Ear, Nose, Throat, etc.—Iodoform is one of the most valuable topical applications in ulcerated conditions in high grades of HYPERÆSTHESIA which forbid the administration of powerful astringents; the light scales fall upon the most sensitive surfaces without exciting distress, while they serve as a protectant from the air. Though not antiseptic, iodine doubtless induces conditions which are not favorable for the development of pyogenic bacteria.

Iodoform, in the nature of a powder, is not a very fine preparation; it is apt to flake and its scales to become matted, while the disagreeable odor prevents one handling it with the same ease as other drugs; iodoform, therefore, is less frequently applied than is the case with the closely allied iodol.

Iodoform has been used with special advantage in SYPHILITIC ULCERATION and ULCERS resulting from the breaking down of tuberculized tissues. It can be used pure, or, as is perhaps best where there is excessive secretion, mixed with an equal amount of subnitrate of bismuth and a little gum arabic; the first of these agents gives increased weight, and the second enables it to adhere better than it otherwise would to the affected surface.

Iodoform is of value in OTORRHEA accompanied with perforation of the ear drum. It is often used in conjunction with boric acid by being dusted upon the affected surfaces. Care should be taken to prevent it caking and retaining the discharge, which this agent possesses in common with boric acid. Delstanche (*Archiv. f. Ohrenheilk.*, 22) asserts that iodoform is useful for the treatment of CHRONIC CATARRH, combined with vaseline and inserted in the Eustachian tube by means of bougies.

The practice of using an iodoform solution in ether was introduced by the late Louis Elsberg, of New York. Iodoform may be conveniently suspended in glycerin in the treatment of CROUPOUS RHINITIS of children. Gottstein distributes the powder through gauze tampons in the treatment of OZÆNA. It may be thrown in the nasal chamber by insufflation—one grain of the agent sufficing for an application. H. Allen has used with advantage cakes of gelatin with which iodoform is mixed. These can be shaped by scissors to any desired shape, and carried well within the nostril by forceps. They are especially adapted for the treatment of infiltrations, confined, as is often the case, to the region of the middle turbinal. Nasal bougies of the same composition, or made with cacao butter, contain from two to five grains. The iodoform may be combined with one-quarter of a grain of the extract of belladonna. A. Jacobi (*Archives of Pediatrics*, February, 1889) applies daily over the parotid gland in MUMPS iodoform collodion, one in eight or ten. Iodoform is used in the treatment of diseases of the respiratory tract, especially by insufflation in LARYNGEAL PHTHISIS. It is usually employed in a pure form, though a small proportion of one of the salts of morphine may be mixed with it. Thus exhibited it may remain from one to two hours, and not only acts as a cleanser, but gives rest to the ulcerated parts by covering them with a light powder; it also appears to exert a retarding effect upon the progress of the disease. It is indicated in any stage, but appears to yield the best results where superficial ulcerations exist upon the arytenoid masses. The application can be made once or twice daily. It is necessary to remember that, though unlikely, iodoform intoxication may be induced. Fifteen grains have been known to cause this accident. (F. Konig, *Centralblatt f. Chir.*, Nos. 7 and 8, 1882.) This may represent an amount beyond the danger line. From two to three grains thrown upon the parts from once to twice daily are safely used. A four per cent. solution of iodoform in turpentine is employed as an inhalant in PHTHISIS and CHRONIC BRONCHITIS.

Iodoform is recommended as an insufflation into the trachea after tracheotomy is performed for DIPHTHERIA. (G. Shirres, *Lancet*, July 24, 1886.) It is also employed as an inhalant when putrid exhalations are present in the trachea and bronchi. Whistler suggests that iodoform be applied to the throat through the medium of glyco-gelatin; one grain being present in each pastille mixed with one minim of glycerin.

Iodoform lozenges are sold in this country, each mass containing one-half grain of the drug.

Diseases of the Eye.—Iodoform is highly thought of by some surgeons as a remedy in Sloughing Keratitis, and has also been used in Purulent Ophthalmia. It is dusted upon the eye in powder or applied as an ointment with vaseline—one drachm to one ounce. It should not be relied upon in serious cases of corneal ulceration to the exclusion of atropine or eserine, the actual cautery, hot stupes, or the Sæmisch incision. It forms an efficient dressing after operations on the lids or enucleation of the eyeball, and may be freely dusted on the parts involved in the operation. Its powers as an antiseptic have probably been overrated.

IODOL. Tetraiodopyrrol.

"A yellow-brown, shining powder, composed of long, prismatic crystals; soluble in alcohol, in three parts of absolute ether, chloroform, and fatty oils, soluble in water only in the proportion of one to five thousand." (U. S. D.) It is dissolved in retinol in the proportion of one to fifty. It is decomposed by light and heat. Mazzoni's solution is composed as follows: Iodol, one part; alcohol, sixteen parts; glycerin, thirty-four parts. Iodol is odorless and tasteless.

Iodol is a substitute for iodoform. Like the drug last named, it is protectant, but the local effect is slightly irritating, and its germicidal properties are so feeble as to be practically nil. Probably owing to a less rapid rate of absorption than that of other preparations of iodine, iodol is usually said to be free from the danger of toxic impression.

The following case, however, must be remembered: Padlin (*Hygiea Swedish*, May, 1887) observed that in twelve hours after dressing a case of necrosis of the clavicle with iodol the patient became dizzy, and finally delirious. The following morning the pulse rose to 139 and the temperature to 102° F., with vomiting and purging. A small amount of albumin and iodine were found in the urine. The wound was carefully washed and the dressing changed to boric lint. The symptoms continued for four days, with traces of iodine found in the urine for two weeks.

General Surgery.—Iodol is used for all purposes for which iodoform is indicated. It may be dusted over wounds as an impalpable powder, or used in ointment, solution, or upon gauze. Owing to the absence of odor iodol possesses advantages over iodoform in the treatment of Venereal Sores.

Pick (*Therap. Monatshefte*, No 1, 1887) obtains good results from iodol in the treatment of Suppurative Adenitis after scraping. He reports cases of Gummatous and Indolent Ulcers which have improved rapidly under the action of the drug. Cerna has had satisfactory results from the action of iodol on Syphilitic Ulcerations. He employs it either in powder or solution. The following is recommended: iodol, one part; alcohol, three parts: or, iodol, one part; alcohol fourteen parts; glycerin, thirty-two parts (see Mazzoni's solution): or as an ointment, iodol, one part; vaseline, six parts. It is claimed for iodol that it does not form crusts with the exudations from wounds, and that on the removal of the dressing the granulations are found to be healthy.

Diseases of the Skin.—As an odorless and tasteless substitute for iodoform this drug was introduced in dermatological practice a few years ago, but without obtaining a foothold as an efficient agent.

The pure powder may be employed in Ulcers, and the ointment or pigment in cases where iodoform might be appropriately used. The following formulæ have been suggested: Iodol, gr. xv; alcohol, fʒiv; glycerin, f℥ij.—Iodol, gr. xl; alcohol (94 per cent.), fʒj; ether, fʒiv; pyroxylin, gr. xvj; castor oil, ♏xxv. M.

Diseases of the Ear, Nose, Throat, etc.—R. N. Wolfenden (*Practitioner*, vol. xxxviii, May, 1887) states that iodol contains seven per cent. less iodine than iodoform, but parts with it more readily. The properties are those of iodoform, but it is without toxic effect. He believes that it is as efficient clinically as iodoform, and can be used for that drug.

As a pigment, iodol can be conveniently combined with glycerin, one drachm each, and the mass diluted in seven drachms of oleum petrolatum.

Iodol, however, is more commonly employed in the form of a powder. The mass is extremely light, and can be easily carried to the desired spot. It acts, in the main, as a protectant. For application to the ear it is praised by Stetter. (*Archives f. Ohrenheilkunde*, 1887.) The indications for its employment are the same as iodoform. Turnbull claims that it is a stimulant, but is much less efficacious than either iodoform or boric acid. It may be thrown pure in the maxillary sinus for treatment of Empyema. In combination with magnesium carbonate it may be insufflated in Chronic Nasal Catarrh of children.

Iodol forms an admirable protectant for Chronic Ulcerations of the Nasal Septum. A pigment of iodol, in sufficient quantity to form a paste with cosmoline suffices. The single objection to its use is the color of the mass, which may cause an unsightly spot to appear at the edge of the nostril, as the heat of the body causes the ointment to diffuse. A two per cent. solution has been employed as a spray in the nostril for the relief of paroxysms of sneezing.

By reason of the disagreeable odor of iodoform and the liability of sufficient quantity being swallowed to affect the appetite, attempts have been made to substitute iodol for this agent in the treatment of LARYNGEAL PHTHISIS. For this purpose both the pigment and powder have been used.

W. Lublinski (*Deut. med. Wochenschr.*, December 23, 1886) found that iodol was well tolerated, and claims that neither cough nor spasm follow its application. He reports that it is more rapid in its effects than either tannic acid, boric acid, or lactic acid. The base of the ulcer becomes more even, the erosion is arrested, and the general health improved. The drug has also been recommended by Sokolowski. (*Gazett Lekarska*, No. 38, 1888.) E. L. Shurley (*N. Y. Med. Journal*, September 11, 1886) believes that iodol has little or no effect in arresting ULCERATION. In his treatment, a minimum preparation is desired, namely, iodol, one part; alcohol, sixteen parts; and glycerin, thirty-four parts; but there is no objection to using the substance pure in the form of insufflation. The powder can be thrown on the affected surface daily, or from two to three times a week. It may be said tentatively that iodol may be substituted for iodoform in the local treatment of LARYNGEAL PHTHISIS. But its superiority to that agent has not been demonstrated.

A lozenge of one-half grain of iodol to each mass has lately been introduced in the trade. It is probably of little value.

Diseases of the Eye.—Iodol has been recommended as a substitute for iodoform in ophthalmic practice. It is applied in the same manner as the latter. The advantages claimed for it are that it is free from the very disagreeable odor of iodoform, and that it is less likely to cause constitutional disturbance, probably because it is absorbed less rapidly. It has not yet been extensively used.

IODUM. Iodine.

"Heavy, bluish-black, dry and friable, rhombic plates of a metallic lustre, a distinctive odor, a sharp and acrid taste, and a neutral reaction. It is sparingly soluble in water, soluble in about eleven parts of alcohol at 15° C. (59° F.), very soluble in ether, disulphide of carbon, and chloroform. It is slowly volatilized at ordinary temperatures." (U. S. P.)

"*Lugol's iodine lotion* consists of from two to four grains of iodine, and double that quantity of iodide of potassium, dissolved in a pint of water. *Lugol's rubefacient iodine solution* is formed by dissolving a half ounce of iodine and an ounce of iodide of potassium in six fluid-ounces of water. *Lugol's caustic iodine solution* is made of iodine and iodide of potassium each an ounce dissolved in two fluid-ounces of water." (U. S. D.) It is important that these three solutions be not confounded. Iodine paint is tincture of iodine spontaneously evaporated to half its bulk.

Among the official preparations of iodine for local use may be named the following: *Liquor Iodi Compositus* (containing five parts of iodine, ten parts of iodide of potassium, in one hundred parts of the solution), *Tinctura Iodi* (containing eight parts of iodine in one hundred parts of the tincture), *Unguentum Iodi* (containing four parts of iodine and one part of iodide of potassium, in one hundred parts of the ointment). A compound tincture of iodine was official in the "U. S. P.," 1870, and was much used; the formula is, iodine, half an ounce, and iodide of potassium, an ounce, alcohol, one pint.

In the German "Pharmacopœia" the "tinctura iodi decolorata" is official, and is made by taking ten parts each of iodine, hyposulphite of sodium, and distilled water, heating them gently until the solids are dissolved, adding sixteen parts of spirit of ammonia and seventy-five parts of alcohol, and allowing the preparation to stand for three days before filtering and using. Such a preparation is a solution of an iodide and should not be regarded as a substitute for iodine.

The combination of iodine and carbolic acid (iodine, two grains; carbolic acid, two grains; ol. petrolatum, one ounce) is preferred by many practitioners to either of these substances used separately.

Iodized cotton is prepared by steeping absorbent cotton in a five per cent. solution of iodine.

Iodine is alterant, rubefacient, vesicant, caustic, antiseptic, and parasiticide.

When iodine is applied to the skin or mucous membrane, it is irritant or caustic. It stains the skin yellow, creates a sensation of warmth if in small quantity, or burning if in larger quantities, and excites a superficial inflammation followed by desquamation. In some subjects the application of the tincture of iodine results in vesication. Pure iodine kept in contact with the tissues produces a brown, dry eschar. The vapor of iodine is often irritating to the mucous membranes of the air passages, causing increased flow of mucus, and even spasm of the glottis. As a simple counter-irritant iodine is frequently employed where it is desired to maintain a mild, persistent influence.

General Surgery.—The tincture is the preparation that is generally used. It is best applied by painting over the part with a camel's-hair brush or a swab. Differences obtain between individuals as to the degree of susceptibility of iodine. For those of a sanguine temperament, in whom the skin is fair and the hair light, the stronger preparations must be used with caution. If an application causes pain, the iodine should be washed off with alcohol, whisky, cologne, or, what is best, a solution of iodide of potassium, and the pain subdued by the application of a starch poultice. A crop of itching papules will often follow the use of iodine under ordinary conditions. The tincture of iodine, as a counter-irritant, is applied to the chest as a paint in PLEURISY, both to abort an attack and to aid the absorption of fluid. In CHRONIC PHTHISIS it is of service to allay harassing COUGH and to check secretion. Where rapid change is going on in the lung its use is contraindicated.

Painted over the front and back of the chest, it often affords relief in CHRONIC BRONCHIAL CATARRH by easing the cough and lessening the expectoration. It may be applied over any portion of the chest affected with pleurodynic pains, and followed with a belladonna plaster. A mustard poultice is often preferable, as it can be renewed should the pain return. The following ointment is used with success in the treatment of Chronic Pneumonia, to hasten resolution: Iodine, ʒss; iodide of potassium, ʒj; lanolin, ℥j. It is to be rubbed thoroughly over the affected portion of the chest. Ringer states that iodine ointment is often used to remove non-inflammatory pains of the chest, but these not being always of the same nature, discrimination must be exercised. When the pain is situated in the muscles (Myalgia), and these are tender on pressure, while the skin may be pinched without pain, the ointment is indicated, but if the tenderness is situated in the skin (Pleurodynia), belladonna is to be preferred.

Injections of iodine through a long nozzled hypodermic syringe directly into the substance of the lung (as in small cavities near the apex) have been used by W. Pepper in Phthisis, but the results have been, as a rule, negative.

In Empyema injections of solutions of iodine were formerly used to remove the great fetor produced by the decomposition of pus, and at the same time to diminish the suppuration. The same use has often been made of them in the treatment of large Abscess Cavities. The employment of antiseptic treatment in these conditions has, in a measure, rendered the use of iodine unnecessary, though, on the whole, the iodine treatment is superior to the bichloride of mercury, as mild solutions induce salivation.

Iodine may be used with advantage painted over joints in Chronic Rheumatism, Chronic Gout, or Chronic Synovitis; in the latter condition it is of service, especially when brought to the point of counter-irritation. Acting as a blister, it relieves pain and assists in the absorption of fluid. It often causes distention of the joint, the good effect not becoming apparent for several days. The sudden increase of the swelling may be considered as a favorable indication of the success of the application. After the counter-irritant effect has been produced, and the skin has become tender, we usually apply an ointment of equal parts of ung. belladonnæ and ung. hydrargyri spread on lint and retained firmly by a bandage, the entire joint being thus fixed.

Injections of tincture of iodine, either pure or diluted, have been used in the treatment of Extensive Serous Arthritic Effusion unaccompanied with inflammation. A portion of the effused liquid should be first evacuated by means of an aspirator, or small trocar and cannula introduced through a valvular incision; the iodine is then injected through the cannula, not more than a drachm (if in the knee joint) of the tincture being used at one time. After the fluid has been allowed to remain for a few minutes it is removed, care being taken not to admit air, and the wound being immediately sealed with collodion. This mode of treatment is favorably spoken of by Erichsen. As the plan is necessarily attended with some risk, it should not be employed except in chronic cases which have resisted other modes of treatment, and in which the distention of the joint is productive of great inconvenience. In ABSCESS OF A JOINT occasionally advantage may be derived by injecting dilute tincture of iodine and afterward washing it away. As a rule, better results in a similar condition may be obtained by using a weak solution of corrosive sublimate. In traumatic, as well as in gouty or rheumatic TENDO-SYNOVITIS, iodine is serviceable. A few coats of the tincture of iodine painted over the affected surface, and the part put at rest, will usually be all that is necessary to effect a cure. In extreme cases the counter-irritant effect of the iodine, followed by an application of belladonna and mercury ointment, will prove satisfactory.

In COMPOUND GANGLION, after the evacuation of the contents, we have found tincture of iodine injected into the sac an available means of treatment. Care should be exercised to leave as small a quantity in the sac as possible for fear of exciting too great an inflammatory action, and by so doing impairing the use of the tendons. If suppuration should occur, a free opening must be promptly made and the case treated as one of palmar abscess. In simple ENLARGEMENT OF A JOINT, the result of pressure, tincture of iodine may be used with advantage by painting over the surface, or, as in HOUSEMAID'S KNEE (if the fluid has been removed) by tapping. Iodine may be injected into the sac to excite inflammation.

In the treatment of SPINAL MENINGOCELE the only plan which has met with success is the injection of a preparation containing iodine, known as Morton's fluid. This is composed as follows: Iodine, ten grains; potassium iodide, thirty grains; glycerin, one fluidounce. About one-half the contents of the cyst is drawn off with a fine trocar and cannula, and from one-half to two drachms of the fluid are injected, the opening being closed with collodion. Similar operations have been essayed in ENCEPHALOCELE, but only where the sac is small or pedunculated are there any prospects of cure.

Tincture of iodine has been used with success in GOITRE. This method succeeds best with the SOFT or CYSTIC GOITRE, though it has been used in the hard or fibrous variety. Eight to ten drops of the tincture should be thrown into the substance of the tumor with an ordinary hypodermic syringe, preferably into different parts of the growth, every three to five days. (Agnew.) The object of employing the injection is to induce a grade of inflammation which, instead of going on to suppuration, shall result in the obliteration of the gland by a new formation of connective tissue, both within and between the walls of the cysts. As an injection for the radical cure of HYDROCELE, no substance has met with such success as the tincture of iodine. The method usually the most satisfactory is that advised by Syme, and which, if properly carried out, rarely fails. After the *tunica vaginalis* has been thoroughly drained of its fluid contents through the cannula, one fluidrachm to three fluidrachms of the pure tincture of iodine, according to the size of the sac, is injected through the cannula by means of a properly-fitting hard rubber syringe, or a gum-elastic bag with a nozzle and stop-cock. After the injection the cannula should be gently removed, care being exercised not to allow the escape of the fluid, which should be diffused over the surface of the sac by gently rubbing between the fingers for a few seconds. Some surgeons use the tincture largely diluted, and allow the solution to flow out through the cannula before the latter is withdrawn. A good deal of pain usually follows the operation, and the scrotum commonly swells to its original size in the course of a few days, the swelling then subsiding until the cure is completed. The pain may be controlled by an opium suppository inserted in the rectum, and the patient kept in the recumbent posture for three or four days.

Tincture of iodine has been used, for its stimulating effect, in the treatment of incomplete ANAL FISTULA by injecting it into the tract. As a rule, it will not be found so reliable a means of treatment as a free incision and packing, thus allowing the tract to heal from the bottom. It is only to be advised in those individuals who object to operative interference.

Iodine injections are used in the treatment of OVARIAN CYSTS. They were first successfully employed by Alison, of Indiana, in 1846. Boinet and other European surgeons have popularized them by their writings. They employ one hundred parts each of tincture of iodine and water, and four parts of iodide of potassium. After tapping the cyst and withdrawing its contents, from four to ten ounces of the solution are injected, the liquid being withdrawn in about ten or fifteen minutes. This mode of treatment, according to Peaslee, should be reserved for cases of UNILOCULAR CYSTS with clear serous contents, in which tapping has been previously employed at least once. Owing to advancement in abdominal surgery, this mode of treatment should not be considered, except under peculiar conditions.

In CHRONIC OVARITIS Lawson Tait recommends that, during the intermenstrual periods, counter-irritation be made with the tincture of iodine to a spot on the skin about two and a half inches in diameter in the region of the ovary. It should be applied every morning and evening as long as the patient can bear it, then discontinued for a time, to be again repeated as often as necessary. He states that he has seen patients pursue such a course for months, and that in the majority of cases it proved efficient.

In Chronic Metritis and Chronic Endometritis, dependent on a granular condition of the cervical canal and accompanied with erosion of the os, iodine is a reliable means of treatment. It excites the capillary circulation of the whole uterus to recuperative activity, cures the erosion and causes absorption of inflammatory products in the submucous tissues. It is employed in the form of the official tincture ; a variety of this known as Churchill's tincture ; iodine chloral ; combined with glycerin ; or in the form of iodized cotton. The formula for Churchill's tincture is herewith given: Iodine, gr. lxxv ; potassium iodide, ʒjss ; alcohol, ℥ij.* The so-called "iodized chloral phenol" is composed of iodine ℥ss, crystals of carbolic acid and chloral each ℥j. The iodine and chloral are first mixed and the carbolic acid added. The application to the uterine canal is best made by an aluminium probe armed with a small swab of cotton saturated in the solution. (W. Goodell.) When combined with glycerin the iodine treatment is ordinarily conducted by a tampon. Byford ("Diseases of Women," p. 428) commends the use of an iodized cotton. This is made by mixing crystals of iodine with cotton and placing in a well-stoppered bottle in a warm place, when the drug will become volatilized and diffuse itself uniformly through the cotton. It may be applied to the cervix and allowed to remain for twenty-four hours; the cotton is renewed every fourth or fifth day.

In the treatment of Periostitis and Osteitis, iodine applied for its counter-irritant effect will be often of service, especially in the early stage of either of these affections. We have found it useful after painting with the tincture of iodine, until the counter-irritant effect has been produced, to cover the region with belladonna and mercurial ointment spread on lint, the affected part to be kept as quiet as possible, while iodide of potassium is administered internally. A few days of such treatment will be followed, as a rule, by marked relief, especially in that class of patients where a strumous element is present.

In Neuritis relief may be given by painting .a number of coats of tincture of iodine over the course of the painful nerve, and repeating until the application becomes too painful to bear. If pain should be severe, a hypodermic injection of atropine and morphine is given, preferably near the seat of pain.

Onychia may often be aborted by painting thoroughly the entire finger, as soon as the slightest pain has manifested itself, with tincture of iodine. A convenient alternative is to insert the finger into wide-mouthed bottle containing the tincture and allow it to dry

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* A similar preparation to the Churchill tincture is called Lawson Tait's tincture. I is composed as follows : Iodine and iodide of potassium, each ʒ ij ; alcohol and water each ʒ ij.

This may be repeated three to four times in the course of the day. If applied early in the disease it seldom fails to effect a cure. Sometimes a BOIL may be aborted in the same manner by painting around it an area of tincture of iodine sufficiently thick to cause considerable counter-irritation. It is preferable to apply the iodine a little distance from the seat of inflammation. If in twenty-four hours relief is not experienced, it is best to envelop the part in a hot flaxseed poultice.

For the removal of excessive callus after fracture, Switzer, an English army surgeon, has reported a case where a large amount of deformed callus has disappeared under inunctions of compound iodine ointment. It would be proper to try the sorbefacient effect of this remedy before radical measures are pursued. In ununited fracture, friction and counter-irritation with iodine are often useful in encouraging a healthy reaction about the ends of the broken bones. Of eleven cases mentioned by Norris, five were cured.

In all GLANDULAR SWELLINGS, whether of a simple strumous or syphilitic nature, the various preparations of iodine have been always held in high repute; the tincture and some forms of the ointment are the forms that have yielded the greatest success. If persistently and carefully applied to the part before suppuration has commenced, resolution, in a large majority of cases, will be brought about, provided constitutional measures are persisted in.

In the treatment of the VENEREAL BUBO the tincture of iodine has been long in use; many of its failures are due to the improper time and manner of its employment. As a prophylactic, it is important that as soon as the slightest tenderness is experienced in the groin the patient be placed at rest, and the surface of the skin round the sensitive glands be painted with three coats of the tincture of iodine, not over the inflamed glands, but in a circle three inches in width surrounding the affected gland on the next vascular area, as taught by J. Ashhurst; by this means the vascularity of the part is greatly reduced. If much induration exists, a hot flaxseed poultice, will often assist in hastening resolution. In the hospital practice in Philadelphia CHRONIC INDURATED BUBO is commonly treated by the use of an ointment of iodide of lead,* one drachm; ext. of belladonna, one-half drachm; lanolin, one ounce, rubbed thoroughly into the groin. After this a piece of lint, on which a sufficient coating of the ointment has been spread, is laid over the affected part, and on this the weight of a small shot- or sand-bag is applied, the patient to be kept in a recumbent position until all tenderness has disappeared.

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* It is convenient to compare the effects of iodine with those which result from the use of salts into which iodine enters. But, at best, such comparisons are inexact.

In CERVICAL ADENITIS a similar preparation to the above may be used, or in its stead the official iodine ointment, diluted with equal parts of belladonna ointment. It is, however, objected to by patients, owing to its tendency to stain whatever it touches. For this reason the iodide of cadmium ointment has been substituted, although in our experience it is not so active a preparation. After suppuration is announced, the external use of iodine is useless.

Diseases of the Skin.—Iodine is employed in the external treatment of diseases of the skin as a discutient and parasiticide. The pure drug is not employed alone.

The tincture of iodine (U. S. P.) is used in the treatment of RINGWORM of the scalp or body, one or more coats being applied with a brush to the affected patch.

Iodized glycerin, composed of a drachm of iodine dissolved in a solution of a drachm of iodide of potassium in an ounce of glycerin, is occasionally applied as a dressing in parasitic skin diseases. It is too strong for ordinary use.

Coster's paste is composed of two drachms of iodine and six drachms of oil of cade. Applied in recent cases of TINEA TONSURANS, it forms a crust, which when removed pulls off the diseased hairs with it.

Diseases of the Ear, Nose, Throat, etc.—The local effect of iodine, in non-irritating proportions, on the mucous membrane of the respiratory tract is to absorb exudations in or about gland tissue, especially of the lymphoid (adenoid) type. Should, however, any fibroid change be found associated with these conditions iodine is worthless. The inability always to determine when this change has set in often leads the practitioner to make a vain attempt to resolve fibroid degeneration with iodine or its preparations.

In concentrated forms iodine is excitant and even corrosive. It is known to be of value in certain phases of chronic inflammation. But the action is not understood. Some writers describe it as astringent. It gives tone to spongy states of mucous membrane in contact with bone; such, for example, as gum-tissue, the roof of the naso-pharynx, the cartilage of the Eustachian tube, lining membrane of the nose, and its accessory sinuses.

In recession of the gums, attendant upon PYORRHŒA ALVEOLARIS, A. Stillé recommends the application, with a camel's-hair brush, after each meal, of an aqueous solution of iodine, fifteen grains; water, one ounce, the mouth to be immediately washed afterward. But this use of iodine has been largely supplanted by more powerful germicides.

A serious objection to the use of iodine arises from the fact that it is not easily taken up, and it is difficult to fix a strength at which it ceases to be irritating; in order to be efficient, iodine must be quickly absorbed.

If, after trial, it is found it has not given relief it is well to wrap the end of an electrode, whose size and shape adapt it to the purpose, with absorbent cotton dipped in a weak solution of the compound tincture of iodine or of Lugol's solution, and attaching the electrode to the negative pole in the form of a sponge held to the cheek, while the physician inserts the positive electrode in the nasal chamber, or in the throat, as the case may be. Special care should be taken to prevent any of the iodine from entering the larynx, since it is irritating to the mucous membrane and excites laryngeal spasm. Iodine mixed with glycerin assuages to some extent the irritative effect. It may be employed in proportion of equal parts of iodine, glycerin and iodide of potassium.

Compound tincture of iodine, when mixed with carbolic acid, glycerin and water, constitutes the Boulton solution.* It is useful in conditions in which the administration of iodine is indicated. The odor of the compound is to many persons unpleasant. It may be used in forms of inflammation of mucous surfaces in which infiltration-processes are present.

Iodism, as a result of local use of iodine in the throat, nose, and mouth, must be rare. The following instance, however, is worthy of credence: After a daily application for ten days of diluted compound tincture of iodine to the glottis, the cervical glands became swollen and ulceration occurred on the lips and the mucous lining of the cheeks. (Eben Watson.)

Iodine is very diffusive. The part to which it is applied should be first dried and a small quantity of the selected preparation painted on the spot. Solutions of iodine are not altered by vegetable astringents, and are compatible with solutions of the salts of zinc. The combinations last named have received the sanction of von Troeltsch as stimulants.

In using strong preparations of iodine a little laudanum lessens the pain.

A dilute preparation of iodine with iodide of potassium (Lugol's solution) is used for a variety of purposes. It forms the basis of a gargle in MERCURIAL STOMATITIS (three drachms of the tincture, fifteen grains of iodide of potassium, to eight ounces of water), and as an injection in EMPYEMA OF THE MAXILLARY SINUS.

In the treatment of diseases of the ear iodine is of high repute. H. McNaughton Jones (*Lancet*, 1889, vol. II) places it in a position second only to corrosive sublimate as a local remedy in CHRONIC SUP-

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* ℞. Tr. iodinii comp., ♏xlv; acid. carbolici, ♏vj; glycerini, ℥ij; aquæ, ℥v. The iodine color gradually disappears and the solution becomes colorless in from eight to ten hours. At a low temperature the change occurs more slowly. (J. W. White, "Dental Materia Medica," p. 67.)

PURATION OF THE MIDDLE EAR. A solution containing one grain of iodine and five grains of iodide of potassium in an ounce of water is of value in the treatment of ECZEMA OF THE AUDITORY PASSAGE. The vapor of iodine is carried into the middle ear by means of the Eustachian tube in SUBACUTE CATARRHAL DEAFNESS. It can be driven into the tube by the catheter, or "snuffed up" through the nasal passage and the Valsalva method of inflation used at once. The tincture of iodine, one drachm, chloroform, one-half ounce, is recommended by C. S. Turnbull as an agent to be applied as above indicated. The details of this method are as follows: Take a one-ounce, ground-stoppered vial, place a piece of absorbent cotton within it, so as to half fill the vial, pour upon the cotton the preparation. The patient inhales from the mouth of the vial through the nostril, or, as the writer expresses it, it is "snuffed up" the nostril, the patient at the same time making a quick Valsalva effort, so that the vapor may be forced in the tympanum; this procedure is often of special benefit in cases where patients from any cause may not be able to receive office treatment; it has proved successful in proportion to the perseverance and intelligence of the subject. The vapor is also of repute in the treatment of ACUTE CORYZA. A few crystals of iodine in a tube open at both ends (plugged with cotton to prevent the crystals from falling out) is held in the hand, the warmth of which disengages the vapor which is inhaled. The stronger tincture of iodine reduces FUNGOID HYPERTROPHIES on the border of syphilitic ulceration of the nasal septum and hard palate.

Nasal bougies of iodine contain five to ten minims of the compound liquor of iodine. To this proportion of iodine one-quarter minim of carbolic acid may be added. Samuel Johnston especially recommends iodine in the treatment of CHRONIC PHARYNGITIS in the following compound: Tr. iodine, one-half drachm; carbolic acid, ten minims; glycerin and water, each one and a half ounces.

Preparations of iodine have been long used in treatment of the surfaces of hypertrophied TONSILS. In our judgment these are useless. Lugol's solution has been injected in the masses with a hypodermic syringe. Such treatment is often followed by speedy reduction of the mass. The rationality of this treatment is based on the fact that repeated inflammations, to which hypertrophy of the tonsil is subject, cause the outer portion of the gland to be resistant, and occupied with interlacing scar-like bands. It is not to be expected that a remedy can be absorbed under such conditions. When, however, an agent is thrown into the soft substance composing the interior, it may be more readily taken up. Equal parts of tincture of aconite and tincture of iodine form a favorite formula of dentists for inflammation about the root of a tooth, the application to be made to the gum in the neighborhood.

F. P. Atkinson (*Practitioner*, January, 1887) uses an iodine gargle of twenty to twenty-five minims of Lugol's solution to an ounce of water in QUINSY. Herzog (*Verein der Aerzte*, in Steiermark, December 10, 1888) applies the official tincture in reducing HYPERTROPHY of the LINGUAL LYMPHOID MASSES. Tincture of iodine is one of the best remedies for MUCOUS PATCHES.

As an inhalant in CHRONIC LARYNGITIS, with diminished secretion, iodine has long been held in high esteem. Lugol's solution may form the basis of the preparation to be used, thus: Lugol's solution, one-half ounce; glycerin, three ounces; water, ten ounces. The glycerole of iodide may be substituted. Waring-Curran recommends the following in DIPHTHERIA as an inhalant: Four grains iodine, four grains iodide of potassium, four drachms of alcohol, and four ounces of water. G. W. Major (*N. Y. Med. Journal*, September 24, 1887) extols iodine in painful states of the crico-arytenoid articulation. In LARYNGEAL PHTHISIS iodine corrects in a measure the attendant infiltration and inflammatory effects, but exerts no check on the progress of the disease. It must, therefore, be regarded as a palliative. Nevertheless, it has its advocates as an agent of the same class with lactic acid and iodoform. (See J. Schnitzler, *Wien. med. Presse*, Nos. 15 to 26, 1884.) Equal parts of benzoated lard, and ointment of iodine, rubbed in the skin over the larynx, serve an admirable purpose in children, in whom a local effect of iodine on the throat is desired.

Carbolized iodine, according to W. C. Glasgow, is a soothing application for relieving CONGESTION OF THE VOCAL CORDS when rest is impossible. (*Trans. Amer. Laryngological Ass'n*, 1887.)

"Iodine Wool:" Cotton wool, one drachm; glycerin, ten minims; tr. iodine, half an ounce. Mix the glycerin with the tincture, saturate the wool with the liquid, and dry.

IODOTANNIN.

Iodotannin according to A. Stabler (*Med. News*, Philadelphia, April 16, 1887) is prepared by dissolving as much tannin as a saturated tincture of iodine will hold. The advantage of iodotannin is that it will dissolve in castor oil, thus overcoming a difficulty of distributing astringents in this medium. Iodotannin can be mixed with castor oil in any proportion; the mixture in turn can be combined with rhigolene. Three minims of the tincture of iodine in the presence of twelve minims of glycerin and tannin added to an ounce of water, is also a convenient form.

CAMPHORATED IODINE.

One-half ounce of tincture of iodine, thirty minims of stronger solution of ammonia, and three and a half drachms of spirit of camphor are combined. After four days filter. A teaspoonful to a pint of water at 80° F. is employed as a stimulating inhalant; it is also used by the Valsalva method in CHRONIC AURAL CATARRH. (Leffert's Pharm.)

IODINE SODIUM CHLORIDE.

Von Kaczorowski (*Deutsche med. Wochenshr.*, Nos. 33–35, 1885) recommends iodine chloride of sodium solution (one per cent. sodium chloride, one-fifth of one per cent. tr. iodine), one-half to a teaspoonful every half to quarter of an hour, for the arrest of bacterial disease of the mouth in connection with the gums and teeth. (See also W. D. Miller, " Micro-organisms of the Human Mouth," p. 236.)

IPECACUANHA.

" Ipecacuanha is the root of *Cephaelis ipecacuanha*." (U. S. P.) The preparations in use for local medication are: Extractum Ipecacuanhæ Fluidum; Pulvis Ipecacuanhæ et Opii; Trochisci Ipecacuanhæ; Trochisci Morphinæ et Ipecacuanhæ.

Diseases of the Throat, etc.—Ipecacuanha stimulates the mucous glands of the respiratory tract, and exhibits a tendency to convert tenacious irritative mucus into a fluid more normal in its consistence. Hence, its impression is valued in the late stages of an ACUTE CATARRH, whether of primary origin or a recurrent condition engrafted upon a chronic inflammation. Ipecacuanha is usually administered by the stomach, but that its local exhibition is also of value is evident. Ringer speaks highly of spray inhalations of ipecacuanha in obstinate " WINTER COUGH " and BRONCHIAL ASTHMA. The wine is used pure, or variously diluted. The first inhalation is apt to excite paroxysm of coughing, which generally subsides, but the spray should be continued; the patient soon becomes accustomed to it, and inhales freely. Both cough and expectoration decrease in a few days, and dyspnœa improves. In order to insure only a topical effect, the patient must eject the preparation and rinse the mouth at each pause in the administration, for the wine collects, and if swallowed is apt to cause nausea and even vomiting.

Lozenges of ipecacuanha are furnished. Each official lozenge contains one-fourth of a grain of the powder.

JEQUIRITY. Abrus. Prayer Beads. Jumble Beads.

The seeds of *Abrus precatorius*. The seeds are of a scarlet color with a black pa[illegible] about the hilum, are not poisonous when swallowed, but excite inflammatory conditi[illegible] when the infusion or a powder is brought in contact with wounds or placed under the sk[illegible] An infusion made by macerating three parts of the seed in five hundred parts of c[illegible] water, with five hundred parts of hot water afterward added, and filtered, is someti[illegible] used in the eye to produce an ophthalmia. There have been isolated from the se[illegible] abrin, which is supposed to be composed of paraglobulin and alpha-phyta-albuminose. The latter is believed to be identical with papain. It is now thought that the ophthalmia is caused by abrin, and not, as was at first believed, by a bacillus. (See *British Med. Jour.*, January, 1884, pp. 476–564.) Martin has shown the jequirity poison to be an albumose. (T. Lauder Brunton, "Modern Therapeutics," p. 47.)

Diseases of the Eye.—Jequirity was introduced into ophthalmic practice by De Wecker about ten years ago, and has been extensively used in the treatment of GRANULAR OPHTHALMIA, particularly of the corneal pannus accompanying this disease. It has been long known that good results may sometimes be obtained in desperate cases of TRACHOMA by inducing an acute purulent conjunctivitis, after the subsidence of which, under treatment, there is a contraction of the granulations, with a marked clearing up of the opaque cornea. This treatment was occasionally resorted to by the older surgeons, who inoculated the affected eye with the discharge from a case of purulent ophthalmia. This involved serious danger not only to the patient, but to others who might be subjected to contagion, and it is claimed that equally good results may be obtained from "jequirity ophthalmia," which is less severe, more easily controlled, and not contagious. A peculiar form of inflammation, accompanied by more or less pain and lachrymation, and the formation of a croupous membrane, occurs usually within twenty-four hours of the application of the drug. Careful treatment with soothing washes or iced cloths may be necessary to control it if it prove excessive. Jequirity is used in the form of infusion, made by macerating the crushed seeds in cold water for from three to twenty-four hours, according to different authorities, and in a proportion of from one to five per cent. A strength of two or three per cent. and a maceration of six hours are perhaps the most generally approved. The infusion is unfit for use if kept too long, and some surgeons have insisted that it should be freshly prepared each day, while others use it when several weeks old, and claim that it can be kept even longer by the addition of a little boric or carbolic acid, which does not impair its efficacy. Its action is chemical, and is not dependent on micro-organisms.

The application is made to the everted lid by means of a pledget of absorbent cotton, and is repeated every day until the full effect is produced. Sometimes several applications a day may be necessary, but it is well to commence with a weak infusion, and not to make the second application for forty-eight hours, as the susceptibility of different patients varies greatly.

Extended experience has shown that flabby, succulent granulations are not favorably affected by this treatment, and it is contra-indicated by a purulent discharge or by an ulcerated cornea, or one that is free from vascularity. Its application may be practically limited to cases of

INVETERATE TRACHOMA with dense granulations and pannus. This remedy is not altogether free from danger, and should be used only in properly selected cases and under careful and skillful management. With these limitations it is a valuable addition to ophthalmic therapeutics, and one that is perhaps not now resorted to so often as it should be.

JUJUBE. Jujube Paste.

When properly made it is prepared from a decoction of the fruit of *Zizyphus vulgaris*, by dissolving in it sufficient gum arabic and sugar to bring it to a proper consistence. As ordinarily made and sold, however, jujube paste is prepared only of gum arabic and sugar pleasantly flavored. It is, however, of equal activity with the true paste.

Jujube is demulcent and forms the basis of a lozenge for use in irritated states of the mouth and throat.

KAOLIN.

Kaolin is a hydrated silicate of aluminum. It is a cream-white clay, which forms an impalpable powder entirely free from grit.

Kaolin is a protectant. It also serves to suspend oils in water.

General Surgery.—Maizee (*Lancet*, June 23, 1888) has employed kaolin in the treatment of MASTITIS. It is applied over gauze and is said to be a satisfactory means of maintaining low temperature. It is also used as an absorbent in wounds accompanied with purulent discharge.

Diseases of the Skin.—Kaolin alone or in combination with other indifferent, sedative, or astringent powders, or substances otherwise medicated, is employed as an application to the skin in various forms of ERYTHEMA and ECZEMA, and other inflammatory skin diseases. It possesses the advantage over starch and some other powders of not becoming rancid and irritating when brought into contact with the secretions of the skin. A similar powder is the "terra cimoliæ," or *fuller's earth.*

Kaolin is sometimes employed in the form of paste to replace ointments in certain cases of ECZEMA RUBRUM of the leg, and similar affections, when greasy applications are for any reason contraindicated. The following formula is found useful: ℞. Kaolin, ℥iiss; olei lini, f℥iss; liq. plumbi subacetatis, f℥j. M. This forms a gray paste of a putty-like odor and is convenient of application.

In ACNE with COMEDO, the following paste has been recommended: ℞. Pulv. kaolin, ʒiv; glycerini, fʒiij; aceti, f℥ij. M.

Diseases of the Throat, etc.—Lefferts prefers kaolin to magnesium carbonate in suspending oil for purposes of inhalation. One-half grain of kaolin is sufficient for each drop of oil.

KAWA. Kava. Ava.

The root of *Piper methysticum*. Kava contains a volatile oil, a resin, a crystalline principle called kavahin, or methysticin, which is somewhat analogous to piperin and cubebin. A solution of kawa resin used locally induces anæsthesia. In this way it is analogous to cocaine. As compared to the agent last named, it possesses a disadvantage, inasmuch as the first effect of the application is to cause pungent pain. Kawa is insoluble in water and glycerin.

An extract of kawa is claimed by N. Weinstein (*Wien. med. Blätter*, No. 26, 1887) to have anæsthetic properties on mucous surfaces.

KINO. Kino.

"The inspissated juice of *Pterocarpus marsupium*." (U. S. P.) "Kino is without odor, and has a bitter, highly astringent taste, with a somewhat sweetish after-taste." (U. S. D.) It is soluble in cold water, more soluble in hot water; soluble in alcohol, and nearly insoluble in ether. The tincture is apt to gelatinize when long kept. Tincture of kino, containing the activity of ten parts of the kino in one hundred parts of the finished tincture, is the single official preparation.

Kino is a powerful astringent. Its efficacy depends upon the presence of kino-tannic acid.

General Surgery.—An infusion of kino is sometimes employed as a wash in LEUCORRHŒA. Powdered kino is occasionally employed as a topical application in CHRONIC ULCERS.

Diseases of the Nose, Mouth, Throat, etc.—Kino is less agreeable to the taste than is krameria, and is, therefore, less commonly prescribed than the agent last named in affections of the nose, mouth, and throat. It, however, is active and reliable, and it is claimed in its behalf that in the form of a powder it can arrest hemorrhage when other astringents have failed. Hence, German physicians praise it in the treatment of EPISTAXIS. In the form of a lozenge it is occasionally used. Each mass contains two grains of the aqueous extract. Since its efficacy depends upon kino-tannic acid, it should not be combined with gelatin. "Krameria-kino-catechu wool:" Cotton, one drachm; glycerin, ten minims; tr. catechu, vel. kino, vel. rhatany, one ounce. Mix the glycerin with the tincture, saturate the wool with the liquid, and dry.

KRAMERIA. Krameria. Rhatany.

"The root of *Krameria triandra* and *Krameria tomentosa*." (U. S. P.) The root contains tannin, starch, saccharine matter, and krameric acid. The drug owes its virtue to the tannin. The following preparations are official: an extract (of uncertain strength); a tincture (containing the activity of twenty parts of krameria in one hundred parts of the finished tincture), and a fluid extract (one cubic centimetre of which represents the activity of one gramme of the drug).

Krameria is one of the most agreeable of the vegetable astringents. It possesses the advantage over many other agents of its class in making a clear mixture with water.

Diseases of the Nose, Throat, etc.—A gargle is prepared by adding four ounces of the tincture to a half pint of water at 100°. An astringent nasal tampon is made by mixing one-half ounce of the tincture with ten minims of glycerin, and saturating a mass of absorbent cotton of convenient size. In the form of a nasal bougie three grains of the fluid extract are contained in each mass. A few drops added to an equal quantity of Cologne water, and appropriately diluted, forms an agreeable mouth-wash, where the membrane lacks tone. Krameria lozenges are often prescribed. One grain is directed to be combined with the base in each mass. A favorite lozenge, with some practitioners, is to exhibit krameria, cubeb, carbolic acid, and potassium chlorate. Gelatin is unsuitable for combination with krameria.

"Krameria-kino-catechu Wool:" Cotton, one drachm; glycerin, ten minims; tr. catechu, vel kino, vel rhatany, one ounce. Mix the glycerin with the tincture, saturate the wool with the liquid, and dry.

LACTUCARIUM. Lactucarium.

"The concrete milk juice of *Lactuca virosa*." (U. S. P.) The fluid extract is the only official preparation, and of it one cubic centimetre represents the activity of one gramme of lactucarium.

Lactucarium is a mild anodyne. "It is almost devoid of narcotic properties." (U. S. D.)

Diseases of the Throat.—Lactucarium is used as a lozenge, each mass to contain one grain of the drug. It is indicated in painful conditions of the pharynx, which are unaccompanied with high grades of inflammation. Lactucarium may be combined with other anodynes, as follows: Extract of lettuce, one and one-half grains; codeine, one-half grain; extract hyoscyamus, one-half grain.

LAMB'S WOOL.

Lamb's wool is a substitute for absorbent cotton in some clinical conditions of the ear. It is also useful in protecting the nasal passages from irritative currents of air. The more elastic character of the hair, as compared to cotton-fibre, enables a pledget of wool to act as a sieve as well as a plug. With some persons, however, it proves to be irritative.

LAMINARIA. Sea-tangle.

A sea weed (*Laminaria digitata*) found upon the shores of Great Britain. It has a stem from six to fifteen feet in length and of about an inch to an inch and a half in diameter at its largest part. The stem shrinks to a marked degree in drying. The dried pieces, when again moistened, quickly regain their natural size. This property makes laminaria valuable for the manufacture of tents and bougies. The plant is one of the sources of iodine, which it contains in large proportion. When burned it produces a superior, fine-grained charcoal.

Laminaria is hygroscopic.

General Surgery.—When lodged in the uterus laminaria slowly expands the cervical canal, which in this way usually becomes accessible to the finger for diagnostic purposes. The value of the agent in the main relates to the management of some of the after-consequences of abortion, or the post-partum retention of the products of conception. It is largely employed by some practitioners in facilitating the application of local remedies to the endometrium. The use of the tent is always accompanied with more or less risk, and is not employed without extreme caution. It must not be introduced into the uterus when there is any evidence of pelvic inflammation.

When used by themselves, the tents are liable to be forced out of the cervical cavity. W. Goodell is in the habit (when the condition of the os uteri will admit) of using two or three laminaria and one sponge tent. The latter assists in retaining the dilating mass in the canal. Laminaria should not be inserted while the patient is in the consulting or out-patient room, but in a hospital ward or bed-room, and the patient should be in bed while the tent is in the cervix. It should never be used just prior to or during the monthly period. Before introduction the vagina should be douched with a mild bichloride-solution, 1-8000, or a two per cent. creolin-solution. It is important that each tent should have attached a piece of strong twine, which will materially assist in its removal. The tent should always be removed in twelve hours, and the vagina washed with an antiseptic solution. If the cervix is not sufficiently dilated for the desired object, another may be employed. There is more danger accompanying the second and third introduction than with the first, so that it is desirable that the cervical canal should be tightly filled at the first treatment, and thus avoid the necessity for another manipulation. (Doran, "Gynæcological Operations," p. 79.) To insure purity Dirner, of Buda-Pesth, immerses laminaria in a one per cent. alcoholic solution of corrosive sublimate.

Diseases of the Ear and Nose.—Small laminaria tents have been used for dilating openings in the tympanic membrane preparatory to treatment of the middle ear. Bougies of the same material are employed in maintaining patulency of the Eustachian tube (Keene). Nasal bougies, have been introduced into narrowed nasal passages, but the effects are transitory.

LANOLIN. Adeps Lanæ Hydrosus (Ph. Br.).

Lanolin is a copyright name applied to a product made by a patented process from the cholesterin fats of wool, and introduced into medicine by Liebreich. It is a saponaceous, fatty substance, absorbing at least its weight of water, not decomposable, and perfectly bland and non-irritating. It has been somewhat hastily claimed that lanolin is more readily absorbed through the skin than is any other base, but the experiments made to determine this point have been incomplete, and the results contradictory. Its blandness and the quality of combining with large proportions of water make lanolin a valuable vehicle for external applications. It is insoluble in water, partly soluble in alcohol, but readily soluble in ether.

General Surgery.—Lanolin is a popular basis for ointments in the treatment of INGUINAL or CERVICAL ADENITIS.

Diseases of the Skin.—Lanolin has been recommended as an inunction in DRY and WASTED CONDITIONS OF THE SKIN. It is said to remove wrinkles in the aged, but this assertion has not been confirmed. It is sometimes employed in massage, and is useful in CHAPPED HANDS.

As a vehicle for the administration of drugs by inunction, lanolin has been highly praised. In the opinion of some observers lanolin appears to possess superior penetrating power over the ointment bases usually employed.

Lanolin sparingly dissolves many medicinal substances; it is rather stringy and clinging, and should be mixed with fat or with vaseline. About one part of vaseline or lard to five parts of lanolin form a convenient proportion.

On the other hand, a small proportion of lanolin added to an ointment or to vaseline gives the mass firmer consistence. Lanolin, two parts; benzoinated lard, one part, is extolled in ECZEMA of the auditory passages. The rather disagreeable odor excludes the use of lanolin about the nostrils.

Diseases of the Eye.—Lanolin has been used in ophthalmic surgery for ointments of yellow oxide of mercury, etc., but has no well-established superiority over cosmoline or lard.

LIMONIS SUCCUS. Lemon Juice.

"The freshly expressed juice of the ripe fruit of *Citrus limonum*." (U. S. P.)

Diseases of the Nose, Throat, etc.—Fanchon (*Med. Record*, October 5, 1889) recommends the local application of lemon juice in EPISTAXIS. He found it efficacious after plugging the nostrils had failed. Bonamy (*Bull. Therapeutique*, April 30, 1887) and Gomez de la Mata (*Gaceta de Oftalmologia, Otologia y Laryngologia*, July, 1886) uses this agent as an application in DIPHTHERIA. The use of lemonade is indicated in ÆSOPHAGITIS, dependent upon the action of an alkali.

LINUM. Flaxseed. Linseed.

The seed of *Linum usitatissimum.* Flaxseed, when reduced to a powder, forms the *ground flaxseed* of the U. S. P. It is of a dark gray color and highly oleaginous. When mixed with hot water it forms a soft, slightly adhesive mass. Much of the linseed of commerce is simply "cake-meal" left after the extraction of linseed oil, which is made by compressing the ground seeds. This cake-meal is unfit for medical purposes, not only because of its poverty in oil, but owing to the fact that exposure to the air has caused it to become rancid. The U. S. Pharmacopœia directs that flaxseed for medical purposes should be freshly ground and free from unpleasant and rancid odors, and should contain at least twenty-five per cent. of oil.

Flaxseed is demulcent and protective. When used in the form of a poultice it is a convenient means of retaining heat and moisture, as well as of maintaining degrees of heat higher than that of the part upon which it is applied.

General Surgery.—A flaxseed poultice, when properly made, is soft, moist, and bland. Its effects can be obtained from warm water, but the method of applying the agent last named, as a rule, is less convenient. Poultices are frequently employed in the early stages of PHLEGMONOUS and SUPERFICIAL INFLAMMATIONS, adding greatly to the comfort of the patient and assisting in the softening and future absorption of the inflammatory products. The action, while sedative, is less efficient than a cold-water dressing. Nevertheless, experience has demonstrated that a carefully applied hot poultice will often cause resolution where a cold-water dressing would in time be followed by suppuration; and the difference in the comfort to the patient is great. If the inflammation has advanced and suppuration is threatened, poultices hasten the pus-forming process. When the tissues are in the stage of high tension, which precedes the suppurating stage, the application of a hot poultice gives relief from pain by relaxing the tissues. The impression made upon the peripheral nerves may also be transmitted to the nerve centres and reflected upon internal organs. It is by this means that warm, moist applications relieve pain in internal and distant parts which have no direct anatomical connection with the integument.

Poultices, like many other valuable therapeutic agents, are often abused by being used too long; in which case the skin becomes white, wrinkled, and sodden, small boils or pustules form, and the blood-vessels lose their tone. Over-poulticing of wounds or ulcerations induces granulations to become pale and flabby, and the healing process to be delayed. Applied indiscreetly to an inflamed joint, poultices may promote suppuration and lead to disorganization.

Poultices have long been prescribed to relieve tension and promote resolution in the treatment of BOILS and CARBUNCLES, but they are strongly suspected of multiplying such lesions by furnishing favorable conditions for the development of the germs of morbid processes. Poultices are especially serviceable for cleansing FOUL, SLOUGHING SORES, or to hasten the separation of SLOUGHS. In the treatment of serous inflammation of the great cavities, like the pleura or peritoneum, large, hot poultices are often of service. In treating PERITONITIS, the poultice should be of sufficient size to cover the entire abdomen, and is applied as hot as it can be borne, and covered with oiled silk. In PLEURISY and PNEUMONIA, the poultice should cover the anterior and posterior portions of the chest, forming what is known as the "jacket-poultice," which may be encased in thin flannel made into a sort of double bag, which is cut to the shape of the individual, secured in front with safety pins, and supported over the shoulders with tapes. Chest poultices are especially convenient in treating children. Poultices may have added to them a small quantity of mustard or some other stimulating material. Made in this way they act as counter-irritants. In inflammation of the lungs poultices are undoubtedly of great service; but, unless they can be carefully attended to by trained attendants, they may chill the patient.

OLEUM LINI. Oil of Flaxseed. Linseed Oil. Flaxseed Oil.

"A fixed oil expressed from *flaxseed* without the aid of heat." (U. S. P.)

General Surgery.—Linseed oil is a bland, unirritating oil, but little used as a topical application, except for making "carron oil;" this is composed of equal parts of linseed oil and lime-water (see Aqua calcis). A preparation somewhat similar to "carron oil," known as linimentum calcis, does not now contain linseed oil. Linseed oil, owing to its rapid drying properties, leaving a thin, impervious, resinoid coating, with no tendency to crack, is employed in the preparation of such protective substances as oiled silk, oiled paper, etc.

While the Pharmacopœia directs that Linum should be restricted to flaxseed, three articles cannot be consistently treated under any other head. Therefore, at this place will be considered the subjects of Lint, Charpie, and Oakum.

LINT.

Lint is of two kinds, domestic and patent. The former is prepared by scraping one surface of old linen with a table-knife until its surface becomes soft. The patent lint is made by the removal of the transverse threads of new linen, and scraping them longitudinally. It is used for the application of lotions or cerates to wounds or other injuries. In the use of lint with either of the above agents, it is well to cover it with waxed paper, in the case of lotions, to prevent evaporation taking place too rapidly, and with cerate to save the outer dressings, and the clothing of the patient. As an absorbent it is little used, since other dressings are cheaper and more efficient.

CHARPIE.

General Surgery.—Charpie, a surgical dressing prepared by unraveling coarse linen, was at one time popular in the profession, particularly as a dressing for granulating wounds. During the Civil War large quantities of this substance were used. It was mostly prepared by housewives from their old table linen. It is much inferior to lint.

OAKUM.

General Surgery.—This common, useful, and cheap preparation is made from old hempen ropes. These are picked to pieces, and form, when carefully prepared, an efficient dressing. The absorbent power of this substance is marked, hence oakum is much used in the treatment of SUPPURATING WOUNDS. The odor is agreeable. It is extensively employed as a padding for splints, in fracture boxes, as compresses, and in the form of pads or rings to prevent pressure on various parts of the body, as around BED SORES and beneath the tendo-Achillis. Oakum threads enter into the formation of the seton, in CHRONIC ARTHRITIS a process of counter-irritation more in vogue formerly than at the present day.

LITHII CARBONAS. Carbonate of Lithium.

Carbonate of lithium is "a light, white powder, soluble in 130 parts of water at 15° C. (59° F.), and in about the same proportion of boiling water; insoluble in alcohol." (U. S. P.)

Carbonate of lithium is resolvent of chalky deposits of gout.

General Surgery.—Garrod has been successful in the removal of GOUTY DEPOSITS in the hands and fingers by the application of a solution of five grains of carbonate of lithium to the ounce—lint being soaked in this and kept constantly applied to the part. A strong solution of a lithium salt is applied with the intention of converting the urates in the tissues into the soluble urate of lithium. The treatment is especially useful when the skin is broken. Under ordinary circumstances this is difficult to heal, owing to the urates being held in the connective tissue and slowly escaping through the wound.

LYCOPODIUM. Lycopodium.

"The sporules of *Lycopodium clavatum* and of other species of "*Lycopodium.*" (U. S. P.) "A fine powder, pale yellowish, very mobile, inodorous, tasteless, floating upon water and not wetted by it, burning quickly when thrown into a flame." (U. S. P.)

Lycopodium is often mixed with various substances, such as pollen, starch, talc, dextrin, and even sand.

Lycopodium acts as a protectant.

Diseases of the Nose and Throat.—Lycopodium may be used as an excipient in the composition of snuffs. Its extreme lightness makes it somewhat difficult to manipulate. A snuff composed of equal parts of lycopodium, gum arabic, and bismuth subnitrate, is in good repute for NASAL CATARRH. Lycopodium may be thrown up the naso-pharynx in combination with sodium chloride and sodium bicarbonate. (Kirchner.)

LYSOL.

That product of the distillation of coal-tar which comes over between 190° and 200° C. (which is the distillate in boiling point next above carbolic acid) is dissolved in fat and saponified by beating with an alkali. The product is a German patented article known under the fanciful name of lysol. It is a brown, oily-looking liquid, with an aromatic, creasote-like odor.

Lysol contains about fifty per cent. of cresols, and forms a clear, saponaceous solution with water; it is also soluble in alcohol, benzin, chloroform, and glycerin.

The superiority of lysol over carbonic acid consists in its complete solubility in water, and its saponaceous character, whereby it becomes especially suitable for the immersion of instruments, and for use as a surgical soap. It is claimed that it is five times more efficient than carbolic acid, and eight times less poisonons. It is allied in many of its properties, as well as in composition, to creolin. A lysol wadding and gauze, as well as a lysol-soap are included in German trade-lists.

MAGNESII CARBONAS. Carbonate of Magnesium.

"Light, white, friable masses, or a light, white powder, odorless and tasteless, insoluble in alcohol, and almost insoluble in water, to which, however, it imparts a feebly alkaline reaction." (U. S. P.)

Diseases of the Ear, Throat, etc.—Magnesium carbonate is used as an indifferent agent to protect sensitive surfaces or to aid in the suspension of oily substances in aqueous solutions in the proportion of one-half grain to a grain of the drug to a minim of oil. It also enters into the composition of powders to be used as insufflations when it is desired to diffuse the effects of such agents as cocaine and iodol. The dried powdered carbonate will often cure an obstinate DERMATITIS of the EXTERNAL AUDITORY PASSAGE after all active remedies have failed. It is simply dusted lightly on the affected parts, and renewed every third day.

Magnesium carbonate also serves a valuable purpose as an antidote to the effects of PHOSPHORUS POISONING in the throat. M. Mackenzie recommends that the agent be given in drachm doses every fifteen minutes until the breath ceases to be phosphorescent. An important use of magnesium carbonate is the aid it gives in distributing oils through watery media. The reader is referred in this connection to the articles on oils.

MASTICHE. Gum Mastiche. Mastic.

"A concrete, resinous exudation from *Pistacia lentiscus*." (U. S. P.) "Mastic is wholly soluble in ether, chloroform, and oil of turpentine, scarcely soluble in the fixed oils, and insoluble in water." (U. S. D.) Alcohol absorbs about nine-tenths of it, but leaves undissolved a resinous substance to which the name of masticin or beta-resin of mastic is applied. The portion soluble in alcohol is called the alpha-resin of mastic or mastichic acid.

Mastiche is a protectant and styptic.

General Surgery.—Mastiche is often employed as a temporary filling for CARIOUS TEETH, in the form of a solution consisting of ether, one part, mastiche, four parts. When properly dissolved it is of an oily consistency. A small piece of cotton the desired size is saturated with the solution and evenly and carefully pressed into the cavity, which has previously been thoroughly cleansed.

Diseases of the Throat, etc.—M. Mackenzie uses a solution, one to five, as a varnish on DIPHTHERITIC DEPOSITS. The membranes should be dried with blotting paper before the application is made.

MATICO. Matico.

The leaves of *Artanthe elongata*, Miquel. (U.S.P.) They are aromatic, spicy, and slightly bitter. The *Extractum Maticò Fluidum* and the *Tinctura Matico* are official.

Matico is styptic and hæmostatic. It is an old remedy for EPISTAXIS, but is now almost entirely discarded.

MENTHOL. Menthol. Peppermint Camphor.

Menthol is a "stearoptene obtained by cooling the oil distilled from the fresh herb of *Mentha arvensis* and *Mentha piperita*." (Ph. Br.) Oil of peppermint upon long standing or exposure to extreme cold deposits a camphoraceous substance, which is menthol. It occurs "in colorless acicular crystals, usually more or less moist from adhering oil, or in fused crystalline masses. Its melting point should not exceed 110° F. It has the odor and flavor of peppermint, producing warmth on the tongue, or, if air is inhaled, a sensation of coolness. It is sparingly soluble in water, and readily soluble in rectified spirit." (Ph. Br.)

Menthol is analgesic, antiseptic, and appears to exert a specific impression upon mucous tissues infiltrated with the products of the bacillus of tubercle.

General Surgery.—Menthol has of late obtained reputation as an anæsthetic. Rubbed into the affected part, it relieves NEURALGIC PAINS when they are superficial and peripheral in their origin. It enters into the composition of the Chinese remedy, "Po-ho-yo." "Po-ho-yo" is applied directly to the affected part in the relief of TOOTHACHE. It is also of repute in relieving GOUTY PAINS. Menthol is extensively used in the form of a crayon in the treatment of FRONTAL HEADACHE and NEURALGIA. After its application a sense of cold is experienced, but persistent use will irritate. Menthol dissolved in chloroform and ether in the following proportions, menthol, one drachm; chloroform, ten drachms; ether, fifteen drachms, is a useful analgesic. It can be applied to the skin over an abscess, or to the skin over a sebaceous cyst prior to excision, etc. Morris (*Lancet*, 1881), has shown menthol to be a germicide. Russel (*Medical Record*, November, 1885) affirms that menthol has a remarkable power of controlling SUPERFICIAL INFLAMMATIONS. He applies an ethereal solution from ten to fifty per cent. two or three times daily, with a camel's-hair pencil, with the effect of controlling the formation of CARBUNCLES, BOILS, and SMALL ABSCESSES. Langaard (*Therap. Monatshefte*, March, 1887) who has made a careful study of menthol, regards it as a valuable sedative when applied locally to marginal BURNS and PAINFUL HEMORRHOIDS. It may be used, as Macdonald recommends, in a ten per cent. alcoholic solution, or an ointment consisting of—menthol, one part; olive oil, half part; lanolin, eight and a half parts. The action of the ointment is more permanent than the crayon. On mucous membranes the following ointment may be applied: menthol, one part, dissolved in olive oil, three parts; lanolin, six parts. In the treatment of BURNS, menthol, one part, dissolved in olive-oil, nine parts; lime-water, ten parts, may be spread on lint or old linen and applied. Girard (*Brit. Med. Journ.*, April, 1888) used equal parts of iodoform and menthol in the treatment of TUBERCULAR ULCERATIONS in bone and the soft parts, with more satisfactory results than where iodoform alone is used.

Diseases of the Skin.—Menthol is employed as an antipruritic in PRURITUS, URTICARIA, and ECZEMA. Elvy recommends a tincture of five to twenty grains of menthol to the ounce of alcohol, and a liniment of twenty-five grains menthol to half an ounce each of lanolin and olive oil. Dubreuilh recommends an ointment of five to twenty-five grains to the ounce of oxide of zinc ointment in subacute, itching ECZEMA. In severe PRURITUS a solution of fifty grains of menthol in an ounce of olive oil has proved useful, the effect lasting from half an hour to a day. Sometimes if used over a large surface menthol produces an intolerable sensation of cold. It cannot be employed with propriety on mucous membranes or on abraded surfaces in the strength usually used in applications to the skin.

Diseases of the Ear, Throat, etc.—Menthol in ten to fifteen per cent. oily solution arrests FURUNCLE in the auditory passage. Cholewa (*Monatschr. f. Ohrenheilk.*, March, 1892) has invited attention to the properties as applicable to auditory disease.

The vapor of menthol from a twenty per cent. solution can be forced into the middle ear in CHRONIC AURAL CATARRH. The solution is best made by dissolving in alcohol. (Adolf Bronner, *Sajous' Annual of Med. Science*, vol. IV, 1890, c. 25.) No remedy for CORYZA is in higher repute than menthol. It is the basis of many proprietary articles, for use as sprays or inhalants. Menthol can be used by insufflation mixed with an equal quantity of magnesium oxide. It is often rubbed on the skin about the external nose, lip, and brow for the relief of secondary distressing sensations which accompany NASAL CATARRH. F. H. Potter (*Trans. Amer. Med. Ass'n*, 1889) recommends the use of menthol in atrophic states of the lining membrane of the nose. Liquid petrolatum in which menthol has been dissolved can be used as a spray. Three grains of pulverized menthol in one hundred grains of an indifferent medium forms the basis of a snuff for CATARRH recommended by Rabow. (*Deutsche med. Wochenschrift*, 1886, No. 5.) A small proportion, say one grain to two ounces, is an agreeable addition to a lotion to be used in ACUTE PHARYNGITIS and RHINITIS. S. Solis-Cohen employs menthol in a wide range of purposes in five to ten per cent. solutions. He claims that it is both cleansing and soothing in CATARRH of various grades. It can be applied conveniently by means of cotton, sponge, or any form of spray largely diluted in benzoinated petrolatum. Kutznetzoff (*Russkaia Meditzina*, No. 17, 1890) recommends menthol in the local treatment of DIPHTHERIA.

C. H. Knight (*Jour. Amer. Med. Ass'n*, December 14, 1889) reports twenty cases of LARYNGITIS treated with menthol. This observer dissolved the drug in cosmoline, one drachm to an ounce, and employed it in the form of a spray or vaporization. Nearly all the cases in which the remedy was essayed were relieved and many were cured. The treatment appears to be especially well adapted to persons of a nervous temperament and in the absence of acute inflammation and œdema of the parts. The same author (*ibid.*, January, 1890, p. 89) recommends that menthol be used in solution in oleum petrolatum in proportion of a half drachm or a drachm to the ounce. Even with the weaker solution irritation and cough is at times excited, while some cases bear the stronger solution without much complaint. Ten to twelve drops may be inhaled from the surface of steaming hot water, or a few drops may be thrown over the ulcerated surface with a laryngeal spray or syringe, or the application may be made directly with a pledget of cotton. On the whole, the most effective method is that of inhalation from an ordinary nebulizer or vaporizer; the mixture being inhaled for a few minutes every half hour.

Rosenberg (*Berliner klin. Wochens.*, No. 26, 1887) found menthol valuable in Laryngeal Phthisis after an extended trial. The remedy was used in the form of a solution, viz.: a half drachm to a drachm of a twenty per cent. solution in oil being thrown upon the affected parts once or twice a day in the beginning of the treatment, the interval between the applications being gradually increased. When ulceration is present treatment by inhalation can be resorted to. Five drops of a twenty per cent. solution may be used every hour with marked benefit. Ossendovsky (*Meditzinskoie Obozrenie*, No. 5, 1889, p. 484) uses menthol in ten to thirty per cent. oleaginous solution rubbed into the parts by Heryng's cotton-wool brush either once daily or thrice weekly. It is well to begin with a ten per cent. solution and gradually pass to stronger ones. A strength of from forty to fifty per cent. is practicable, but represents the maximum strength, since a thirty per cent. solution as a rule represents the limit of safety, for intense local irritation may supervene when a forty per cent. solution is used. Blumenau (*Jour. of Laryng. and Rhinology*, 1889, p. 256), however, claims satisfactory results in painting Tubercular Ulcers with a solution as high as fifty per cent. Irritative phenomena were of shorter duration than those ensuing after applications of lactic acid. A. B. Thrasher (*Cincinnati Lancet and Clinic*, June 22, 1889) employs a ten to twenty per cent. solution by cotton application, or in a vaseline spray. This writer finds such a combination of especial value in overcoming Dysphagia of Laryngeal Phthisis. A method of treatment for Ulcerations of the Larynx has been proposed by Gougenheim and Glover (*Journal of Laryngology and Rhinology*, September, 1890, p. 365), in which the effects of menthol and creasote are combined; one part of menthol is added to one to five parts of creasote in five parts of oil of sweet almond.* It is reported that such a mixture painted upon the affected surfaces is especially valuable in the treatment of Laryngeal Ulcerations. It may also be used by insufflation mixed up with equal parts of magnesium oxide. It may also

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* The proportions of the formula in the original paper stand as follows:—

Sweet oil of almond, ...	100 grammes.
Menthol, ...	20 "
Sweet oil of almond, ...	100 "
Creasote, ...	10 "

Mix the two solutions in water bath.

be inhaled from Schreiber's apparatus. Ossendovsky claims that menthol is a reliable anodyne.

In inhaling menthol for TRACHEITIS the following method is commended: Place the drug in a Florence flask or a wide-mouth bottle which retains two tubes through the stopper: one of the tubes is used for inhalation and the other to establish a current of air. Raise to a moderate temperature (113° F. [45° C.]). The bottle is now filled with white fumes. Inhalations are made carefully and slowly—lack of this precaution will excite choking sensations. Each treatment should consist of five or six inhalations several times a day. Menthol in substance may be used in a solid form, as in relieving the pain of a CARIOUS TOOTH.

MOLLIN.

Mollin is a soft soap containing an excess of fat with glycerin. It is prepared by saponifying, without heat, one hundred parts of cocoanut oil with forty parts of potassium hydrate solution (specific gravity 1.145), and then adding thirty parts of glycerin. It is yellowish white, of a smooth consistence, free from rancidity, and readily removed from the skin by warm or cold water.

Diseases of the Skin.—Kirsten (*Monatshefte f. prakt. Dermatol.*, No. 8, 1886) and Kahn (*Berlin. klin. Wochens.*, September 8, 1890) have recommended this substance as a vehicle for cutaneous medication. It is stable, neutral in reaction, unirritating, and mixes well with medicaments of various kinds. On account of its stability, Kirsten believes that mollin may supersede ointments, such as ung. hydrarg., etc., for use in warm climates.

We have employed mollin as a vehicle, but do not find it to possess any advantages over those already in use. It resembles H. von Hebra's "glycerinum saponatum." (See *Sapo.*)

TINCTURA MOSCHI. Tincture of Musk.

"Musk, ten parts; alcohol, forty-five parts; water, forty-five parts; diluted alcohol, a sufficient quantity to make one hundred parts." (U. S. P.)

The tincture of musk, one part added to eight parts of "mixtura oleoso-balsamica," of the German Pharmacopœia, with two grains each of acetic acid and carbolic acid, is recommended by M. A. Fritsche (*Berlin klin. Wochenschrift*, 1887, No. 27) for inhalation in ACUTE CORYZA.

MUSCARINE.

Muscarine is an alkaloid obtained from a fungus (*Agaricus* or *Amanita muscarius*). It has also been obtained as a derivative from brain substance. It and its nitrate are uncrystallizable. The nitrate is a hygroscopic brownish-yellow liquid, viscid and soluble in water.

Diseases of the Eye.—Muscarine is a decided myotic, but has not been much used in ophthalmic practice. It is said to act more energetically on the ciliary muscle than on the pupillary. It may be used in solution of from one to four grains to the ounce.

MUSCARINE SULPHATE.

E. L. Shurly (*N. Y. Med. Jour.*, September 11, 1886) believes that one-fiftieth to one-tenth grain of this agent to the ounce of water is useful as a spray in relieving irritation in NASO-PHARYNGEAL CATARRH.

MYRRHA. Myrrh.

"A gum resin obtained from *Balsamodendron myrrha*." (U. S. P.) Myrrh forms an emulsion-like mixture with water, and is dissolved, with the exception of its impurities and a gummy substance, by alcohol, ether, and solutions of the alkalies; it contains a small proportion of volatile oil, a large proportion of resin, and a little gum. A tincture of myrrh is official and represents twenty parts of myrrh in one hundred parts of alcohol.

Myrrh is detergent and astringent.

General Surgery.—As a vaginal wash in VAGINAL and UTERINE CATARRH, tincture of myrrh, a fluidounce to the pint of water, will often be found efficacious.

Diseases of the Mouth, etc.—Myrrh has long been employed, either alone or in conjunction with other remedies, as a mouth-wash in cases of PTYALISM, or when the gums from other causes have become spongy, with a tendency to recede from the teeth. A serviceable mouth-wash, which we have employed for the above-mentioned conditions, is: Potass. chlor., ʒij; tinct. myrrhæ, fʒij; aquæ, q. s. f℥vj. It is also of value as a stimulating wash in CARIES and NECROSIS, accompanied with offensive discharge. Owing to the fact that the precipitated resin adheres to the teeth and gums, its employment in the mouth has been criticised, but the advantages it offers over other detergents make it still a favorite with practitioners. The following recipe obviates the employment of alcohol: Pulverized myrrh and alum, each one drachm; conserve of rose, one ounce. A bolus of convenient size to dissolve in the mouth.

Myrrh is used also as a component of a powder for insufflation, as well as in the form of a tincture diluted for use as a gargle. In the last-named exhibition it has been for a long time an ingredient in a gargle, for ANGINA accompanied by œdema, either when found in acute or sub-acute conditions, in the proportion of one-half ounce to about a pint of water. The tincture of myrrh is recommended by C. Seiler in the treatment of OZÆNA.

MYRTUS. Clove-Bark.

Clove-bark is obtained from a tree (probably *Myrtus acris*, order Myrtaceæ) which grows in the West Indies.

M. Mackenzie employs an oil of clove-bark as an inhalant—six minims to the ounce—in inflammatory affections of the throat.

NAPHTHALINUM. Naphthalene. Naphthalin.

Naphthalene is a compound of carbon and hydrogen, and is a typical member of the naphthalene series of hydrocarbons, just as benzene is a typical member of the benzene series. It is prepared from the fractions in the distillation of coal-tar which come over between 180° and 250° C. From these fractions it separates as a dark-colored mass, and is then purified by repeated treatment with sodium hydrate and sulphuric acid. Finally the purification is completed by repeated sublimation.

Naphthalene occurs in large, shining, crystalline scales, having a peculiar, penetrating odor, and a burning, aromatic taste. It is insoluble in water and slowly soluble in cold alcohol, but is readily soluble in hot alcohol, in ether, chloroform, carbon disulphide, and fixed and volatile oils.

Naphthalene is stimulant, antiseptic, and parasiticide.

General Surgery.—It has been employed with good results as an antiseptic in the treatment of WOUNDS. Henri Lasserre (*Wiener med. Presse*, October 13, 1889) advises naphthalene in place of iodoform in CHRONIC ABSCESSES and ADENITIS, the solution being easily made by the addition of a little alcohol. The following formula is commended: Naphthalene, two drachms; alcohol, two fluidounces; water, four fluidounces. The water should be added hot and the whole filtered. Since the crystals will clog the syringe the preparation must be warmed before using. After the evacuation of the abscess the cavity should be gently distended with the solution.

Diseases of the Skin.—Naphthalene has been highly recommended in the treatment of PARASITIC skin diseases, particularly SCABIES. It is, however, not equal to naphthol, while its extensive application is by no means without danger, Schwimmer having reported a case of fatal nephritis resulting from its use. It is sometimes fraudulently or ignorantly substituted for naphthol in prescriptions.

NAPHTHOL. Iso-naphthol. Beta-naphthol.

There are two naphthols which are related to naphthalene, just as phenol or carbolic acid is related to benzene.

They are prepared by the action of fuming sulphuric acid on naphthalene for several hours at 200° C. By this treatment the two naphthalene-sulphonates are formed; these are combined with calcium and separated from each other by repeated crystallization. By converting them into sodium salts and fusing with sodium hydrate the alpha- and beta-naphthols result.

Beta-naphthol is the best known, and it is the one which bears the name of naphthol. It occurs as colorless, lustrous, scaly crystals, or as a white, crystalline powder. Its odor has a faint resemblance to phenol, and the taste is transient and somewhat burning.

Naphthol is soluble in alcohol, ether, chloroform, oils, and alkaline liquids; scarcely soluble in cold water, but soluble in hot water to the extent of six grains in one fluid ounce.

Alpha-naphthol resembles the beta- compound in most of its physical properties.

Naphthol is antiseptic. (Bouchard, quoted in *Therap. Gaz.*, 1888, p. 241.) Its slight degree of solubility protects from possibility of toxic impression, while it remains efficient as a germicide. It is five times as strong as carbolic acid and three times as strong as creasote, and is much safer than corrosive sublimate.

General Surgery.—This mixture is employed in the treatment of wounds and granulating surfaces. At the Massachusetts General Hospital it substitutes flaxseed in making poultices. Lint is saturated with a solution and applied.

Diseases of the Skin.—The effect of naphthol on the epidermis is slightly loosening. A strong application causes light brown discoloration and exfoliation of epidermis. Its influence upon HYPERTROPHIED EPIDERMIS, as in PSORIASIS, is somewhat similar to that of chrysarobin and pyrogallic acid, but naphthol is less efficient than either of the agents named.

Naphthol was introduced by Kaposi (*Wien med. Wochens.*, July, Nos. 22 and 23, 1881, and *ib.* No. 31, 1882) as an application in PSORIASIS. He employed an ointment of eighty grains to the ounce with success. We repeated Kaposi's experiments with naphthol in PSORIASIS* and found that a naphthol soap, composed of two drachms of naphthol in an ounce of sapo viridis acted satisfactorily in cleansing the scalp of psoriatic scales, while an ointment of naphthol, one drachm to the ounce of lard, succeeded in removing the patches from the body.

Further experience, however, seemed to indicate naphthol as possessing only an inferior power for the removal of psoriasis eruption, while if used over an extensive surface symptoms of poisoning have been known to appear, preceded by a cloudy discoloration of the urine. However, naphthol must be regarded as one of our best local remedies in some cases of PSORIASIS when chrysarobin and pyrogallic acid cannot, for any reason, be employed.

In SCABIES Kaposi recommends: Naphthol, ʒiv; sapo viridis, ℥jss; pulv. çretæ ℈ij; adeps, ℥viij. M.

In hospital practice a single energetic application is made of this ointment over the affected parts, after which the skin is thoroughly powdered with starch and wrapped in a linen sheet. A single day is enough for patients under this treatment.

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* "Experiments in the Use of Naphthol," etc. *Am. Jour. Med. Sci.*, October, 1883.

Few can endure an application so heroic. We find the following a better formula for average cases of SCABIES: ℞. Naphthollis, sulphuris precip., āā ℥j; adipis, ℥viij. The patient takes a hot bath with soap, and after drying anoints himself thoroughly with the ointment. Clean underclothing is then put on. The subsequent treatment consists in nightly inunctions, the same underclothing being worn for a week. At the end of that time a bath is taken and the patient is inspected. If any traces of scabies remain the treatment is gone through with for another week. One to two weeks' treatment generally cures walking cases. Toward the last the proportions of naphthol and sulphur should be diminished, as irritation is apt to be set up in persons with sensitive skins if the stronger preparation is continued.

Naphthol has been employed in the treatment of ECZEMA. An oil with naphthol (five grains to the ounce of olive oil) has been used in IMPETIGINOUS ECZEMA of the scalp, and an ointment of naphthol, a few grains to the ounce, have been employed in the treatment of SQUAMOUS ECZEMA, but, in our experience, without much good result.

In PRURIGO and in ICHTHYOSIS naphthol has been used with some benefit.

In ACNE, HYPERIDROSIS, and in the vegetable parasitic skin diseases naphthol has been employed with success. We have found it effective in TINEA CIRCINATA, having employed it in the strength of about a drachm to the ounce.

In the PITYRIASIS CAPITIS naphthol is an efficient remedy. It may be employed in the form of the oil, or soap.

Allen (*N. Y. Med. Record*, May 21, 1887) recommends naphthol in the treatment of FOUL ULCERS, especially those of a syphilitic character. He prefers it to iodoform. In IMPETIGINOUS ECZEMA connected with PEDICULOSIS CAPITIS, in PEDICULOSIS VESTIMENTORUM, and in PRURITUS, Allen likewise found naphthol useful.

Diseases of the Mouth, Throat, etc.—Naphthol is recommended by dentists for the correction of FOUL BREATH in diseases, of bacterial origin, of the gums and teeth.

In a group to which naphthol belongs may be mentioned the following, concerning which exact information is wanting. Naphthaline is recommended by Kutznetzoff (*Russkaia Meditzina*, No. 7, 1890) for the local treatment of DIPHTHERIA. A. P. Favitzky (*Journal of Laryngology and Rhinology*, June, 1890) claims that β-naphthol mixed with oil of sweet almond, one-half drachm to the ounce, has an anæsthetic effect in LARYNGEAL PHTHISIS. The solution is prepared from a half to two drachms of the drug, and one ounce of the oil of sweet almond. (*Meditzenskoië Obezrenie*, No. 19, 1889, p. 585.)

Diseases of the Eye.—Vignes (*Annal d'Oculist*, VI, 251) strongly recommends naphthol as an antiseptic in ophthalmic surgery. He uses it in four per cent. solution (40 to 1000, with 2 grammes of alcohol), and claims that it is superior to the bichloride of mercury on account of its unirritating character and entire freedom from danger to the cornea.

CAMPHORATED NAPHTHOL.

Camphorated naphthol is prepared from one part of beta-naphthol and two parts camphor. The mixture forms a brownish, transparent liquid.

Diseases of the Nose, Throat, etc.—Fernet (*Le Progres Médicale*, March 9, 1889) found that by mixing one part of naphthol and two parts of camphor a greasy liquid is formed, which he claims is of service. It is relied on by some practitioners to prevent suppuration in ACUTE TONSILLITIS after all other measures have failed. This writer (*Bull. et Mémoires de la Société de Thérapeutique*, February 27, 1889) has employed camphorated naphthol successfully in TUBERCULAR ULCERATIONS OF THE TONGUE. The daily application greatly improved an ulceration in a man aged forty. Ruault (*Archives de Laryngol.*, 1889, p. 73) used camphorated naphthol in vaseline as a local application to the turbinated bones in OZÆNA.

HYDRONAPHTHOL.

This is a product claimed to be derived, by reduction, from beta-naphthol. It is said to have all the antiseptic powers of the naphthols without their toxic properties.

It is soluble in alcohol 1–2 parts, in cold water 1–1100 parts, and in hot water 1–300 parts. It also dissolves in benzol and the fixed oils.

Hydronaphthol is a germicide* and deodorant. It resembles creolin and carbolic acid in its general effects, but is held by its votaries to be superior to these agents, since it is without a disagreeable odor and can be used without exciting irritation or danger of toxic impression.

Diseases of the Skin.—Hydronaphthol has been recommended as a germicide by Dockrell (*Lancet*, November 30, 1889). He considers it superior to bichloride of mercury, and employs it in the form of a plaster for the cure of RINGWORM OF THE SCALP. The scalp is shaved, washed with a hydronaphthol soap, and, after drying, a ten per cent. hydronaphthol plaster is applied in narrow strips, so as to cover in the affected area. Outside the margin of the patch of strips a melted ten per cent. hydronaphthol jelly is painted, so as to exclude the air. At the end of four days the plaster is removed. A twenty per cent. plaster may then be substituted after washing, etc., as before, and after four days this may again be replaced by a ten per cent. plaster. The remainder of the scalp is to be anointed with a five per cent. hydronaphthol ointment, morning and evening. Dockrell claims the best results from this plan of treatment.

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* For experimental research see Stackler and Dubrief. (*Bull Gén. Thérap.*, March 30, 1892.)

Diseases of the Mouth, Throat, etc. — James Truman, of Philadelphia, uses hydronaphthol as a mouth wash and a preventive of Dental Caries, and in the treatment of "Pulpitis, Decomposed Pulps, Gingivitis, and in Pyorrhœa Alveolaris." The progress of the obstinate affection last named is arrested so long as the affected surfaces are kept under the influence of the drug. The following formula is recommended for general use; a slightly weaker mixture can be used as a mouth wash: Hydronaphthol, gr. xvj; alcoholis, ʒj; water, ℥j. Add a teaspoonful to a half pint of water and use freely. It is recommended to make up in small quantities, since the preparation is not stable.

J. V. Shoemaker (*Proc. Phila. Co. Med. Soc.*, October 17, 1883) commends "naphthol" for the treatment of Diphtheria. Hydronaphthol is probably intended.

Hydronaphthol is used by W. C. Caldwell as a spray for Diphtheria in combination with papain and hydrochloric acid as follows: ℞. Papain, ʒij; hydronaphthol, gr. iij; acid. hydrochloric, dil., ♏xv; distilled water, ℥iv.

NUX VOMICA.

"The seed of *Strychnos nux vomica*." (U. S. P.) Nux vomica is one of the sources of strychnine, to which alkaloid it owes its activity.

Strychnina. Strychnine. (Strychnia, U. S. P., 1870.)

Strychnine is described as being in "colorless, octahedral, prismatic crystals, or white crystalline powder, permanent in the air, odorless, having an intensely bitter taste and an alkaline reaction. Soluble in sixty-seven hundred parts of water and in one hundred and ten parts of alcohol at 15° C. (59° F.); in twenty-five hundred parts of boiling water and in twelve parts of boiling alcohol; also soluble in six parts of chloroform, but almost insoluble in ether or in absolute alcohol." (U. S. P.)

For medicinal purposes a salt of strychnine should always be prescribed rather than strychnine, which, as will be seen from the account, is practically insoluble. Sulphate of strychnine (strychninæ sulphas) is the one commonly used. It is soluble in ten parts of water at ordinary temperature, and in two parts of boiling water; it is also soluble in twenty-six parts of glycerin.

General Surgery.—In Incontinence of Urine the tincture may be applied to the perineum. Lint is saturated with it and retained as a wet dressing. Henry Thompson advises such a method in cases in which belladonna has failed.

Diseases of the Nose.—M. Mackenzie ("Diseases of the Throat and Nose," Amer. edition, Philada., 1884, vol. ii, p. 461) uses strychnine in the proportion of one-twenty-fourth to one-sixteenth of a grain in an indifferent medium by insufflation in ANOSMIA.

NYSSA. Tupelo.

The root of *Nyssa Aquatica.* From this substance tupelo tents are made. It is asserted that tupelo expands more readily than either sponge or laminaria. Tupelo wood comes in pieces six inches long, three-quarters of an inch wide, and one-sixteenth of an inch thick.

Tupelo is hygroscopic.

General Surgery.—A tupelo tent was proposed by G. E. Sussdorff. (*Richmond and Louisville Journal,* 1879.) It expands to about double its compressed size, but less powerfully than does the sponge tent. Tupelo is preferred by some practitioners to other forms of tents, since it is not liable to become offensive from the decomposition of secretions.

Diseases of the Nose, etc.—According to J. W. Gleitmann (*N. Y. Med. Jour.*, November 9, 1889), the manner of application is simple. After the nostril is thoroughly cleansed with a disinfectant solution and anæsthetized with cocaine, a piece of tupelo is cut the required size and introduced into the nasal chamber. After remaining in position for fifteen to twenty minutes the expansion is accomplished and the piece is removed. After a second cleansing, a piece of tin foil, which also can easily be shaped according to the requirements of the case, is inserted, and the patient is dismissed. The tin foil maintains the increased diameter of the nasal chamber and can be kept in place with impunity.

OLEUM ANACARDII. Cashew-nut Oil.

The oil of *Anacardium occidentale*, a tree growing in the West Indies.

Diseases of the Skin.—Cashew-nut oil is an exceedingly irritant application. It is used in tropical countries as a stimulant in various forms of ulceration, and especially in the local treatment of LEPROSY. The oil is applied to the anæsthetic spots until a blister is almost produced, also to the tubercles until they open. The lesions are then dressed with Gurjun oil, *q. v.*

OLEUM CAJUPUTI. Oil of Cajuput.

Oil of cajuput is "a volatile oil distilled from the leaves of *Melaleuca cajuputi.* A light, thin, bluish-green, after rectification, colorless liquid, of a peculiar, fragrant, somewhat camphoraceous odor, an aromatic, bitterish taste, and a neutral reaction. Freely soluble in alcohol." (U. S. P.)

General Surgery.—Oil of cajuput, like other highly-stimulating, essential oils, relieves TOOTHACHE when introduced into the cavity of a carious tooth. Diluted with equal parts of olive oil, it has been employed as an embrocation in MUSCULAR RHEUMATISM.

Diseases of the Throat, etc.—Eight minims to the ounce of water, in the presence of a little magnesium carbonate or alcohol, is recommended by M. Mackenzie as a moderately stimulating inhalant.

OLEUM CALAMI. Oil of Calamus.

An oil distilled from the rhizome of *Acorus Calamus.*

Diseases of the Throat.—The oil of calamus is one of the best of stimulating oils which are adapted for inhalation. Five minims may be added to the ounce of water, in the presence of two grains of magnesium carbonate, and a teaspoonful of the mixture diluted in a pint of water at 140° F.

OLEUM CARYOPHYLLI. Oil of Cloves.

"A volatile oil distilled from cloves."—(U. S. P.) Oil of cloves is prepared by the repeated distillation of cloves with water, in which salt has been dissolved in order to heighten its boiling point; the oil afterward is separated from the distilled oil and water. Freshly prepared oil of cloves is colorless; it soon becomes yellowish, and old examples are brown. It is freely soluble in alcohol, ether, chloroform, benzol, benzin, and disulphide of carbon. Its specific gravity is from 1.03 to 1.06; when pure, it sinks in water. It has the peculiar property, when mixed with an alcoholic solution of potassa, of congealing entirely and losing the clove odor. This is one test of its purity.

General Surgery.—Oil of cloves, when applied locally, acts as a counter-irritant and local anæsthetic, but it is inferior to many other substances. It is often used to benumb sensitive dentine, or even exposed pulp in CARIES of the teeth. Dropped on a piece of cotton and placed in the cavity it will often relieve TOOTHACHE.

OLEUM CINNAMOMI. Oil of Cinnamon.

Oil of cinnamon is "a volatile oil distilled from *Cinnamon.*" (U. S. P.) Two oils of cinnamon are official, namely, the oil distilled from *Cinnamomum zeylanicum* (Ceylon cinnamon, or true cinnamon) and the oil distilled from an undetermined species of cinnamon grown in China (oil of Cassia, *infra*). The oil of cinnamon of the Br. Ph. is obtained from the first-named source. Differences in the quality, flavor, as well as price of the two oils is to be noted. The best oil of Ceylon cinnamon is ten times the more costly. The Ceylon oil is rarely used, the oil of Cassia being substituted. Both oils are soluble in alcohol and the other solvents of essential oils, and are used to give odor and taste to various medicinal and cosmetic preparations.

According to Mackenzie, six minims of the oil of cinnamon to the ounce of water, in the presence of a little magnesium carbonate, constitutes a moderately stimulating inhalant.

OLEUM CASSIÆ. Oil of Cassia.

A volatile oil distilled from undetermined specimens of *Cinnamon* grown in China. (See Oil of Cinnamon.)

General Surgery.—C. Black (*Medical News*, December, 1890), in a paper on essential oils in surgery, speaks highly of the oil of cassia as possessing antiseptic properties. It is not as powerful as is the bichloride of mercury, but, on the other hand, fewer objections can be urged against it. A convenient form for exhibition of the properties of oil of cassia is an aqueous solution, prepared by distributing the oil in distilled water by magnesium carbonate and filtering. Or it may be mixed with boric acid and applied as a dry dressing. It may also be incorporated in an ointment with vaseline, in strength of from half a drachm to a drachm to the ounce.

Diseases of the Throat, etc.—In the opinion of M. Mackenzie the oil of cassia assists the effect of nitrate of potassium in fumigation, in overcoming a disposition to SPASM OF THE PHARYNX, TRACHEA, AND BRONCHI. One drachm added to nine drachms of alcohol may be employed to moisten the strips of paper prepared by steeping in a solution of nitrate of potassium. Used alone it is slightly stimulating. F. P. Norway (*Therapeutic Gazette*, May 16, 1892) claims that the oil of cassia is of value in the treatment of ACUTE ANGINA. G. V. Black adds a small amount of the oil to peroxide of hydrogen in disinfecting the abscess cavity in TONSILLITIS.

OLEUM COCOIS NUCIFERÆ. Cocoanut Oil.

This is a fixed oil, derived from the seed of *Coco nucifera*. It is of the color and consistence of lard, of a peculiar and, when fresh, pleasant odor. It is largely used in the manufacture of soap. It is open to objection, however, on account of the odor which it leaves on the hands, since the oil easily becomes rancid. If rancid cocoanut oil be present the soap will have a peculiar, acrid, disagreeable taste. Cocoanut oil must not be confounded with cacao butter. (See Oleum Theobromæ.)

General Surgery.—Owing to its physical properties and agreeable odor, cocoanut oil is extensively employed by masseurs when the skin is delicate and the cutaneous absorption of an oily substance is to be desired, as in cases where cod-liver oil cannot be taken internally.

OLEUM GAULTHERIÆ. Oil of Gaultheria. Oil of Wintergreen.

An oil distilled from the leaves of *Gaultheria procumbens*. The odor of the oil of gaultheria is penetrating. One minim added to a pint of water, to which two ounces of glycerin have been added, will suffice to produce distinct impressions.

Oil of birch distilled from Betula lenta is chemically and physically identical with oil of wintergreen. The artificial oil of wintergreen is often a mixture of several compound ethers, and is in no way to be compared with the natural oils of wintergreen and birch.

Oil of wintergreen is stimulant, antiseptic, and deodorant.

Diseases of the Mouth, Throat, etc.—In a proportion of one drop to two or three ounces, oil of gaultheria has of late years become popular as an agent to impart flavor to lotions and gargles. It also has an appreciable value as an ingredient of an embrocation for use in cases in which a rheumatic element is present. Oil of wintergreen is recommended by W. D. Miller as an antiseptic to arrest DENTAL CARIES. The following forms the basis of an agreeable spray in painful SUBACUTE INFLAMMATION OF THE PHARYNX. Req. Eucalyptol and oil of wintergreen, each one grain; menthol, two grains; oleum petrolatum, two ounces. Use in an atomizer.

Each lozenge of gaultheria contains the one-twentieth of a minim of the oil.

OLEUM JUNIPERI. Oil of Juniper.

"A volatile oil distilled from *Juniper.*" (U. S. P.) It is distilled from the berries and tops of the plant, although it is contemplated that it be distilled from the berries alone. "It is soluble in twelve parts of alcohol, forming a turbid liquid." (U. S. P.)

Oil of juniper is stimulant.

General Surgery.—Oil of juniper wood* is employed in the preparation of catgut ligatures, the gut being immersed for a week and then transferred to absolute alcohol, in which it should be kept until required for use.

Diseases of the Throat, etc.—Oil of juniper *berries* is recommended as a stimulant in vocal disability. It is used as a steam inhalation at 140° in CHRONIC LARYNGITIS. Twenty minims may be added to an ounce of water in the presence of a little magnesium carbonate. A teaspoonful of this mixture may be added to a pint of water at 140° F. as an inhalant. When thus exhibited it induces constriction of the pulmonary vessels, and is thus indicated in HYPERÆMIA. (A. Israi.)

OLEUM CADINI. Oil of Cade.

An empyreumatic oil obtained in the destructive distillation of *Juniperus oxycedrus.*

Oleum cadini is stimulant.

Diseases of the Ear.—A drachm of the oil of cade may be added to an ounce of the ointment of ammoniated mercury and employed in CHRONIC ECZEMA of the auricle. It may be mixed with an equal quantity of alcohol for local application to the external meatus for PITYRIASIS. (See Pix.)

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* Only the best quality of the oil of juniper wood should be used.

OLEUM LIMONIS. Oil of Lemon.

Oil of lemon is a "volatile oil extracted by mechanical means from fresh lemon peel." (U. S. P.) It is also procured by immersion of lemon peel in warm water and removing the oil which rises to the top, as well as by finely grating the peel and permitting the oil to separate at the bottom of the vessel containing it. Oil of lemon soon becomes rancid. It is wise to add to it a proportion of alcohol, say five to eight per cent.

Oil of lemon is stimulant and deodorant.

Diseases of the Throat, etc.—Oil of lemon is recommended by Lefferts to cover the odor of cubeb; one drop of the oil is added to three of the oil of cubeb.

OLEUM MENTHÆ PIPERITÆ. Oil of Peppermint.

"A volatile oil distilled from peppermint." (U. S. P.) The oil is distilled from the leaves of *Mentha piperita.* On long standing or exposure at a low temperature, oil of peppermint deposits stearoptene-menthol or peppermint camphor. (See Menthol.)

OLEUM MENTHÆ VIRIDIS. Oil of Spearmint.

"A volatile oil distilled from *Spearmint.*" (U. S. P.) The oil is distilled from the leaves of *Mentha viridis.*

Both of the above-named oils are sedative and anodyne. Yet the maximum impression is irritant.

General Surgery.—The local action of the oil closely resembles that of menthol. Oil of peppermint is an old remedy for FACIAL NEURALGIA. A piece of cotton saturated with the oil is laid over the affected part, covered with a piece of oil silk or sheet caoutchouc, and retained by a bandage. Care must be taken not to leave it in contact with the skin too long, as this agent, in common with other essential oils, is capable of producing an irritant effect. Merely painting the skin with a camel's-hair brush or a small tuft of cotton will sometimes be found beneficial. In DENTAL CARIES a small pledget of cotton saturated with the oil and placed in the cavity of a tooth after it has been thoroughly cleansed will be found as efficient in relieving pain as oil of cloves, and much more permanent than chloroform. Oil of peppermint is sometimes added to liniments for its local sedative effect.

Diseases of the Skin.—The oil of peppermint is employed in the treatment of affections of the skin, attended by PRURITUS, when the skin is not broken. It is an anæsthetic simply. It has been highly recommended in PRURITUS VULVÆ, but we are inclined to think that it will usually cause more pain than benefit on muco-cutaneous surfaces.

Diseases of the Throat.—Oil of peppermint is employed in the form of a lozenge, each mass containing one-twentieth of a minim.

OLEUM MORRHUÆ. Cod-liver Oil.

Cod-liver oil is "a fixed oil obtained from the fresh livers of *Gadus morrhuæ*, or other species of Gadus." (U. S. P.) Cod-liver oil is not soluble in alcohol, but is readily soluble in ether. According to the researches of Dejongh, it contains "a peculiar substance named gaduin, oleic, stearic, and palmitic acids, with glycerin, butyric, and acetic acids, various biliary principles, iodine, and traces of bromine." (U. S. D.)

General Surgery.—Cod-liver oil has been used by inunction with asserted advantage in the treatment of SCROFULOUS ENLARGEMENTS. Better results can be obtained by the use of iodine ointment, and, if it can be retained by the stomach, by the internal administration of the oil.

Diseases of the Skin.—Cod-liver oil is used in the treatment of skin diseases, to soften crusts, etc. Olive oil answers a similar purpose, and possesses the advantage of being free from disagreeable odor. A plaster into which cod-liver oil enters is much used by French dermatologists in the treatment of ECZEMA.

Diseases of the Ear and Throat.—Cod-liver oil is sometimes applied in DRY ECZEMA of the external auditory passage; it is also used as a basis for "the brown citrine ointment." It is held by Wilde, of Dublin, and by A. D. Williams, of Cincinnati, that this form of the ointment of the yellow oxide of mercury is more useful than those forms into which lard or neat's-foot oil enters.

Cod-liver oil may be substituted for olive oil in relieving DYSPHAGIA OF CHRONIC LARYNGITIS.

OLEUM MYRISTICÆ. Oil of Nutmeg.

"A volatile oil distilled from nutmeg (*Myristica fragrans*). A colorless or pale, yellowish liquid, having the characteristic odor of nutmeg, a hot, spicy taste, and a neutral reaction. Sp. gr. about 0.930. It is readily soluble in alcohol." (U. S. P.) *Spiritus Myristicæ* is official.

Oil of nutmeg, while pungent, is a stimulating anodyne.

General Surgery.—In CHRONIC RHEUMATISM and OLD SPRAINS the oil of nutmeg is often added to soap liniment, and forms a satisfactory and stimulating embrocation.

Diseases of the Mouth, etc.—A few drops of the oil of nutmeg upon cotton inserted into the cavity will often give relief to the pain of a CARIOUS TOOTH.

OLEUM MYRTI. Myrtle Oil.

This is a volatile oil distilled from the leaves and flowers of *Myrtus communis*. It is of a yellowish or greenish-yellow color, has a specific gravity of 0.891, and consists of a hydrocarbon and myrtol. Myrtol is the constituent to which the peculiar properties are due. It is that portion which distills between 160° and 180° C. It is said to be composed of dextro-pinene and eucalyptol.

Diseases of the Throat, etc.—According to M. Mackenzie, six minims of the oil of myrtle added to the ounce of water, in the presence of three grains of magnesium carbonate, may be used in the proportion of a teaspoonful to a pint of water at 40° F., as a stimulating inhalant in ACUTE TONSILLITIS.

OLEUM OLIVÆ. Olive Oil. Sweet Oil.

"A fixed oil expressed from the ripe fruit of *Olea europea*." (U. S. P.) Cotton-seed oil, poppy oil, colza oil, groundnut oil, and lard oil are used in immense quantities as substitutions for olive oil; since, with the exception of the common adulterant, cotton-seed oil, which is slightly irritating, all these varieties of oil have many of the properties in common with olive oil. The U. S. D. gives tests for the detection of adulterations. By exposure to the air olive oil soon becomes rancid. Olive oil enters into the composition of several cerates, ointments, and plasters, notably *Emplastrum Plumbi* and *Unguentum Diachylon*.

Olive oil is emollient and protectant.

General Surgery.—Carbolized oil, consisting of a five to ten per cent. solution of carbolic acid in sweet oil, was at one time extensively used in the treatment of wounds. Since it has been shown that the amount of acid employed is ineffective, so far as any antiseptic properties are concerned, the practice has been abandoned. Sweet oil was in extensive use as a wound dressing, especially after amputation, by the older surgeons. It had the advantage of being bland and unirritating and not allowing the dressing to adhere to the cut surfaces. Olive oil forms one of the substances in repute for the preparation of instruments used in the surgery of the mucous cavities. In the treatment of unusually tight STRICTURES OF THE URETHRA the injection of a little sweet oil with a syringe will often prove more serviceable than anointing the instrument.

As an emollient, sweet oil is largely employed in enemata. It has a special tendency to soften scybalæ and assist in their removal. It also serves in the reducing of the irritation which accompanies the presence of SEAT WORMS.

Diseases of the Skin.—Olive oil enters into the composition of a number of preparations employed in the local treatment of skin diseases. Employed alone, it is useful to soften CRUSTS and SCALES and to remove EPITHELIAL DEBRIS as a preliminary to more active treatment.

Olive oil enters into the composition of ***unguentum diachylon***. It must be of the best quality here and perfectly fresh, or the result is not satisfactory.

Olive oil in connection with carbolic acid forms an admirable application in PRURITUS ANI: ℞. Acidi carbolici, gr. c; olei olivæ, *ad* f℥j. M. The olive oil is sometimes replaced by almond oil, but there is practically no difference between the two.

Diseases of the Ear, etc.—Olive oil is used for softening CERUMEN, but it is less efficacious than glycerin. It serves as a convenient vehicle for the application of iodine in instances in which the tincture is contraindicated. A grain of iodine may be added to an ounce of oil. In this form it is recommended by Kramer for HERPETIC INFLAMMATION OF THE EXTERNAL MEATUS. It also destroys insects which have lodged in the external meatus. Olive oil relieves PAINFUL DEGLUTITION.

Diseases of the Eye.—Olive oil is a useful application to the eye in the treatment of LIME BURNS of the cornea and conjunctiva, or for the limitation of the action of caustics applied by the surgeon. It has also a soothing effect in recent abrasions of the cornea, and may be advantageously used in these cases as a menstruum for cocaine.

OLEUM PINI SYLVESTRIS. Oil of Fir.

This article is official in the Ph. Br. and is defined to be the oil distilled from the fresh leaves of *Pinus sylvestris*. The leaves of this tree, either alone or with the leaves of species of other European firs and pines, are, when beaten with mallets, converted into a condition in which they can be roughly felted, and the product is known as "fir-wool." A fluid extract, or a solution of the oil in alcohol, is sold under the name of "fir-wool extract." Since "fir-wool" most probably derives its efficacy from the oil of fir contained in it, the two agents are here considered under one head.

The oil of fir is stimulant, antiseptic, and deodorant.

General Surgery.—"Fir-wool" is much used in Germany and among the Germans in this country as a wrap for parts attacked by RHEUMATISM, whether articular or muscular; it is usually sprinkled with the oil of fir.

Diseases of the Throat, etc.—An admirable stimulant inhalant is prepared by adding ten drops of the oil of fir to a pint of water at 140°. A little magnesium carbonate (a scruple to the ounce) may be added. As a steam inhalation the same ingredients as above can be used in CHRONIC LARYNGITIS. The oil when inhaled induces powerful constriction of the pulmonary vessels, and is thus indicated in HYPERÆMIA. It appears to be more potent than either of its succedænea, oil of turpentine or oil of juniper. (A. Israi.) One-half to one per cent. may be said to be the average strength of solution for the use of this agent. (W. E. Casselberry.) It can be used much stronger, forty drops to the ounce, as a mild stimulant and disinfectant in PUTRID SORE THROAT and DIPHTHERIA. H. MacNaughton Jones recommends a stimulating gargle of four to eight drops to the ounce of water.

OLEUM RICINI. Castor Oil.

Castor oil is "a fixed oil expressed from the seed of *Ricinus communis*." (U. S. P.) Castor oil is soluble in an equal weight of alcohol, and in all proportions in absolute alcohol or glacial acetic acid.

Castor oil is emollient and protectant.

General Surgery.—Castor oil is used in England as the basis of a preparation for anointing bougies, catheters, etc. Murchison speaks highly of an application of two parts of castor oil and one part of balsam of Peru spread on lint and laid over SUPERFICIAL ULCERATIONS. It should be changed several times a day.

Diseases of the Skin.—Castor oil has one advantage over the other oils commonly used in making applications to the skin (ol. olivæ, ol. lini, ol. amygdalæ) that it is soluble in alcohol. This characteristic makes its employment peculiarly convenient in many cases where an oleaginous adjuvant is required. In lotions and other applications on the scalp it is desirable to employ an oily material to correct the drying effect of the soaps and similar remedies used in ECZEMA, PITYRIASIS, SEBORRHŒA, etc. The addition of ten to sixty drops of castor oil to an ounce of an alcoholic solution ordinarily suffices.

Glycerin is often substituted for castor oil in lotions for the scalp; but rarely, we think, with the same good effect.

Diseases of the Mouth, etc.—Five drops of castor oil to the ounce of collodion forms a protectant to ABRASIONS about the lips.

Diseases of the Eye.—Dr. John Green (*Trans. Am. Oph. Soc.*, 1875) has recommended castor oil as a menstruum for applying atropine to the eye, on the ground that it ensures a longer contact of the drug with the cornea than is possible with the aqueous solution, which is rapidly washed away by the flow of tears. As the sulphate is not readily soluble in oil, he recommends the substitution of the alkaloid, and directs one grain of atropine to be dissolved in two minims of alcohol and mixed with fresh castor oil in any desired proportions. This preparation is particularly applicable to cases of ABRASIONS OR PAINFUL ULCERS OF THE CORNEA.

OLEUM RUSCI. (See *Pix.*)

OLEUM RUTÆ. Oil of Rue.

"A volatile oil distilled from *Ruta graveolens* (Linn). Oil of rue is soluble in an equal weight of alcohol." (U. S. P.)

Oil of rue is a stimulant.

Diseases of the Throat, etc.—Oil of rue is recommended by Potter as an inhalation in CHRONIC CATARRHAL LARYNGITIS.

OLEUM SANTALI. Oil of Santal. Oil of Sandal Wood.

"Oil of santal is a volatile oil distilled from the wood of *Santalum album*." (U.S.P.) It is "a pale yellowish or yellow liquid, of a peculiar, strongly aromatic odor, a pungent and spicy taste, and slightly acid reaction; specific gravity, about 0.945. It is readily soluble in alcohol." (U. S. P.) It is apt to be adulterated or sophisticated with oil of cedar-wood, which has a specific gravity of 0.948.

The Brit. Pharm. gives its specific gravity as 0.96, the Indian Pharm. as 0.98. The examination of a number of specimens of oil known to be pure sandal-wood oil proves that the specific gravity is from 0.96 to 0.99; so that the specific gravity as given by the U. S. P. is too light.

Oil of santal is antispasmodic and sedative.

Diseases of the Throat, etc.—According to M. Mackenzie, oil of santal reduces the irritative action of nitrate of potassium fumigation in overcoming spasms of the larynx, trachea, and bronchial tubes. The oil is used by W. Murrell (*Brit. Med. Journal*, December 12, 1885) for WINTER COUGH in form of inhalation, in combination with petrolatum, oil of cubeb, and terebene.

Six minims of the oil to the ounce are exhibited as an inhalant. Inhalations of steam impregnated with the oil are useful for soothing the throat in PHLEGMONOUS INFLAMMATION.

OLEUM THEOBROMÆ. Oil of Theobroma. Cacao-butter.

Cacao-butter is "a fixed oil expressed from the seed of *Theobroma Cacao*." A yellowish white solid, having a faint, agreeable odor, a bland, chocolate-like taste, and a neutral reaction. It melts between 30° and 35° C. (86° to 95° F.) (U. S. P.) It is apt to be adulterated with paraffin, stearin, tallow, etc. It is especially important when butter of cacao is used as a basis for suppositories, that the pure article be employed. The adulterants raise its melting point to above the temperature of the human body, and consequently suppositories made with cacao-butter so manipulated do not melt and are useless.

Cacao butter is emollient and protectant.

Diseases of the Nose.—Cacao-butter is admirably adapted for serving as a vehicle for the application of drugs in the nasal chamber. (H. C. Wood, *Therapeutic Gazette*, January, 1889.)

OLEUM THYMI. Oil of Thyme.

"A volatile oil distilled from *Thymus vulgaris*." (U. S. P.)

One minim of the oil of thyme and three minims of the oil of anise, added to a half pint of water with a little carbonate of magnesium, are useful in cases of cough arising from dilated bronchi. (See *Thymol*.)

OLEUM TIGLII, U. S. Croton Oil.

"Croton oil is a fixed oil expressed from the seeds of *Croton tiglium*." (U. S. P.) It is soluble in alcohol, ether, disulphide of carbon, and oil of turpentine.

The application of croton oil to the skin causes irritation, inflammation, and a papular eruption which soon becomes pustular. A persistent impression is almost of caustic strength.

General Surgery.—Croton oil was at one time much employed to excite counter-irritation, being a simple agent and rapid in its action. If it is used for this purpose, it should be diluted with four parts of sweet oil and one of almond oil. The action of the mixture is less prompt than that of pure croton oil, but the resulting inflammation is milder. It is often added to tincture of iodine (a drachm to the ounce) and painted over the apex of the lung as a counter-irritant in INCIPIENT PHTHISIS. It also gives relief when painted over the seat of pain in PLEURODYNIA and INTERCOSTAL NEURALGIA. Great care should be exercised in the use of croton oil in any strength, and it should never be applied on delicate skin, such as that of the scrotum or the mammary gland.

A liniment of croton oil is official in the British Pharmacopœia. It contains one part of the oil, and three and one-half parts each of oil of cajuput and alcohol. The liniment applied to the chest affords relief to dyspnœa in PHTHISIS and CHRONIC BRONCHITIS.

West advises a liniment made of one part of croton oil and ten parts of camphor liniment in congestive DYSMENORRHŒA and CHRONIC CONGESTION OF THE UTERUS. It is recommended to be sponged over the sacrum twice daily; the application irritates the skin and affords relief without producing a troublesome eruption.

Diseases of the Skin.—Croton oil is employed for the destruction of small, superficial NÆVI, when it acts by exciting an inflammation, the products of which close the enlarged blood-vessels. It has likewise been used to destroy small patches of TINEA TONSURANS, being introduced into the hair follicles on a gold or platinum needle. The violent inflammation set up destroys the fungus, but also leaves scars.

OLEUM VALERIANÆ. Oil of Valerian.

"A volatile oil distilled from *Valerian*." (U. S. P.)

Oil of valerian is antispasmodic.

Diseases of the Throat, etc.—Two minims of the oil of valerian to a half pint of water, to which a little carbonate of magnesium has been added, is an effective inhalant in hysterical LARYNGEAL SPASM.

OUABAIN.

Ouabain is a glucoside prepared from the wood of *Acocanthera ouabaio*, a tree indigenous to the east coast of Africa (Mountains of Comal). It has also been prepared from the seeds of a species of *Strophanthus*.

Ouabain occurs in white crystals, having a slightly bitter taste, soluble in hot, but scarcely soluble in cold water. It is soluble in moderately concentrated alcohol, but insoluble in anhydrous ether, chloroform, and absolute alcohol.

An extract of the wood of the ouabaio tree has been used by the natives as an arrow poison.

Diseases of the Eye.—Ouabain has made some claim to rival cocaine as a local anæsthetic. Panas (*Arch. d' Ophth.*, 1890, March–April) found that it produced corneal anæsthesia, lasting three or four hours without dilatation of the pupil, in rabbits, but caused no loss of sensation in the human eye.

OPIUM. Opium.

Opium is "the concrete, milky exudation, obtained in Asia Minor by incising the unripe capsules of *Papaver somniferum*." (U. S. P.)

"On exhausting a hundred parts of opium, previously dried at a temperature of 105° C. (221° F.), with cold water, and evaporating the solution to dryness, an extract is obtained which should weigh between fifty-five and sixty parts." (U. S. P.) The powdered opium is defined as 'Opium dried at a temperature not exceeding 85° C. (185° F.) and reduced to a moderately fine powder.' Powdered opium for pharmaceutical or medicinal uses should contain no less than twelve nor more than sixteen per cent. of morphine." (U. S. P.)

Among the official preparations may be mentioned the following: *Acetum Opii* (containing the activity of ten parts of powdered opium in one hundred parts of the vinegar, and flavored with a little nutmeg and sugar); *Tinctura Opii* (of the same strength), *Tinctura Opii Deodorata* (of the same strength), *Vinum Opii* (of the same strength, but containing a proportion of cinnamon and cloves), *Extractum Opii* (of uncertain strength), and *Emplastrum Opii* (containing six parts of extract of opium in one hundred parts of a mixture of Burgundy pitch and lead plaster).

Opium contains a number of alkaloids; the principal one is morphine, and of less importance are codeine and narceine. It is necessary to consider in this article morphine and codeine.

Under the head of "*opium wool*," Woakes (*l. c.*) mentions the following formula: "Cotton-wool," one drachm; glycerin, ten minims; tincture of opium, half an ounce. Mix the glycerin with the tincture, saturate the wool with the liquid, and dry.

The local impression of all the preparations of opium is anodyne.

Those mentioned in this article will include: Papaver; Pulvis opii; Tinctura opii; Vinum opii; Morphina; Morphinæ acetas; and Codeine.

PAPAVER. Poppy Heads.

Diseases, of the Ear, Nose, Throat, etc.—Fomentations of an infusion of poppy heads is an old domestic remedy for OTALGIA.

OPII PULVIS. Powdered Opium.

General Surgery.—Powdered opium, or the dried watery extract, which is about twice the strength of the crude drug, is extensively employed, made in a suppository of cacao butter, in the treatment of PELVIC INFLAMMATIONS. A suppository containing opium is a favorite means of administering the drug after operation for the removal of HEMORRHOIDS. Also in many of the operations about the genito-urinary tract a suppository of opium has a soothing and quieting effect, especially after the introduction of a bougie or catheter; it often prevents the occurrence of urethral chill, so common with some patients. In the treatment of BOILS and CARBUNCLES, Shillitoe recommends the local application of extract of opium, in the consistency of syrup. The extract must be anointed over the part several times during the day. Used early, it will often cause a boil to abort. Subsequently a plaster, composed of equal parts of soap, opium, and mercury, is spread on leather and applied to the affected spot. Should suppuration set in an opening may be made through the plaster and a poultice placed over the entire mass. Opium mixed with nutgall ointment will be found a valuable treatment of painful and bleeding PILES. Care should be taken to keep the contents of the bowels in a soluble condition.

TINCTURA OPII. Laudanum.

Laudanum was employed extensively in the treatment of WOUNDS. Lint saturated in a preparation of equal parts of laudanum and water was applied to the lesions and covered with waxed paper to prevent evaporation. Pure laudanum is a favorite dressing with some surgeons as a primary dressing for the treatment of stumps. The double effect of a moist and soothing medicament is thus obtained. This dressing is now largely superseded by lotions of bichloride of mercury. In the absence of antiseptic dressings laudanum will be found particularly serviceable in treatment of wounds of the hand. Laudanum is frequently added to flaxseed poultices to allay the pain of SUPERFICIAL INFLAMMATION.' Sufficient may be absorbed in this way to produce sleep. In SPRAINS and CONTUSIONS a combination of laudanum and lead-water is of established merit. The following formula is herewith given: ℞. Tinct. opii; liq. plumbi subacet. dil., āā ℥ij; aquæ, q. s. Oj. For convenience, equal parts of laudanum and Goulard's extract may be kept on hand, and water added in sufficient quantity. The relief afforded by this means of treatment in the first twenty-four hours is striking. In cases of FRACTURE, where there is much contusion of the soft parts, relief to pain is afforded by enveloping the part in laudanum and lead-water before adjusting the limb to the splint. Care should be taken that the dressing is not continued for too great length of time, as it may have a tendency to delay union by preventing the necessary amount of inflammatory deposit about the ends of the fragments. In the absence of suppositories, laudanum mixed with starch water will be found a reliable way to administer opium in the relief of pain in PELVIC INFLAMMATIONS. It is important that the rectum be previously emptied. In the treatment of GONORRHŒA laudanum is frequently added to the injection for its soothing effect, in the proportion of one part to five. Laudanum is often added to the tincture of iodine, especially when the use of this agent is to be prolonged, and when the sedative and alterative action is desired, as in the treatment of PERIOSTITIS and PAINFUL SYPHILITIC NODES.

VINUM OPII. Wine of Opium.

Diseases of the Eye.—Wine of opium was much used by surgeons of the last generation as a collyrium in the treatment of CONJUNCTIVITIS. In the chronic form of the disease it was employed pure, and in the acute form was diluted with three or four parts, or more, of water. It has entirely passed out of use, but might sometimes be found a convenient and useful application.

MORPHINA. Morphia. Morphine.

Morphine is usually employed either in the form of the sulphate, the hydrochloride, or, more rarely, the acetate. The sulphate of morphine is the salt in general use. It is "soluble in twenty-four parts of water and in seven hundred and two parts of alcohol, in seventy-five hundredths part of boiling water, and one hundred and forty-four parts of boiling alcohol." (U. S. P.) The hydrochloride of morphine has the same solubility in water, but is dissolved by sixty-three parts of alcohol. The acetate of morphine is the most soluble salt when freshly prepared. It dissolves in twelve parts of water and in sixty-eight of alcohol.

General Surgery.—When morphine is spoken of, the sulphate is always understood, unless otherwise specified. Notwithstanding its similarity in effect to opium, the morphine salts cannot be substituted in all cases for the crude drug. They are chiefly indicated for the relief of pain or nervous irritability, to induce tranquillity, and where immediate action is desired.

A common mode of administering morphine is by a suppository made with cacao butter. So much of the impression ordinarily sought for is local, that it is held to be appropriate to include some account of it in this place. The dose by the rectum is about the same as by the mouth, one-fourth of a grain. Nausea and gastric irritability, which occasionally follow the ingestion of the drug by the mouth, are often avoided.

The absorption of morphine by the rectum is not so rapid as when taken by the mouth, although the difference is but slight, provided the bowel is free from impacted fæces. The endermic method has practically been supplanted by the use of the hypodermic syringe, while it remains true that in certain conditions a blistered surface may be dusted over with almost any powder containing morphine, or a granulating surface may be similarly treated; absorption from this source is not so likely to occur as in other methods. The therapeutic uses of morphine are many. In the treatment of SHOCK, either as the result of traumatism or of surgical operations, morphine is a most valuable remedy, and is more efficient when given hypodermically than by the mouth or rectum. The exhibition must be conjoined with the use of cardiac stimulants and external heat. It is not infrequently the case that attempts are made to combat this dangerous condition without the use of morphine, the reason attributed for its non-administration being that the patient is not complaining of pain. But morphine acts as a stimulant to the nervous system, which in turn immediately affects the circulation. It is not unusual to see reaction begin immediately after its administration. The dose can be usually a little larger, one-fourth of a grain, and repeated, if necessary. In the treatment of SCIATICA, LUMBAGO, and other NEURALGIC AFFECTIONS no remedy promises so speedy a cure or relief from pain as the subcutaneous injections of morphine often with or without atropine. An available combination is as follows: Morphinæ sulph., gr. one-sixth; atropinæ sulph., gr. $\frac{1}{120}$. It is important that the injection should be administered near the seat of pain or in the course of the affected nerve. In obstinate SCIATICA injections deep in the substance of the muscle, or into the nerve sheath, have been often productive of good results when other measures have failed. The endermic method has been employed by sprinkling morphine over a blistered surface along the course of the affected nerve, but the results obtained are not so satisfactory as when the morphine is injected with a syringe. Morphine is of special value in the treatment of CHORDEE. Berkeley Hill advises the subcutaneous injection of one-fifth of a grain on retiring. In obstina cases of the affection we have added one-sixth of a grain to a supposito containing belladonna and camphor with gratifying results. In CYSTIT morphine is available, especially when its action is aided by the u of hot hip baths. Sir Henry Thompson commends the form of admi istration by suppository. In HEMORRHOIDS the addition of a sma amount of morphine to the ointment of nutgalls will often relieve the pa resulting from this troublesome affection.

Diseases of the Ear, Nose, Throat, etc.—In the nose morphin or the watery extract of opium is ordinarily employed. Nasal bougi may contain one-quarter of a grain of morphine, or one grain of the extract. NASAL HEADACHE can be sometimes relieved by insufflating one-eighth grain of morphine every two or three hours. *Ferrier's snuff* contains about one grain of morphine to an ounce of an indifferent medium, such as an ounce of pulverized acacia and six drachms of subnitrate of bismuth. In a second formula of this nostrum the proportion of morphine is stronger, viz.: Morphine, one grain to a half ounce mixture composed of subnitrate of bismuth, three drachms, and pulverized acacia, one drachm. In yet a third the proportions are as follows: One grain of morphine to two drachms, namely, one each of subnitrate of bismuth and powdered acacia. This want of uniformity in the preparation is sufficient reason, in the judgment of the writer, to discard it. In proportion of about one-fifth of a grain to one drachm of indifferent medium tartrate of morphine has been used in overcoming the pain and throbbing of ACUTE RHINITIS. It may be combined advantageously with cocaine.

No preparation of opium for use in the nasal chamber should be long continued. Owing to the readiness with which the drug is absorbed from the mucous membrane, and the danger thereby incurred of the contraction of the opium habit, the following note is of interest: J. B. Mattison (*Med. and Surg. Reporter*, December 13, 1890) relates the case of a gentleman who, to relieve an attack of migraine, sniffed up the nostril five to ten drops of a solution, in the strength of ten grains of morphine to an ounce of water. He gradually increased the dose until he used as much as a drachm of the drug daily. This was his stipend for a period of eighteen months. All the opiate effect was thought to have been obtained through the nasal membranes, as special care was taken to prevent swallowing the mixture, and whatever amount passed into the mouth was ejected.

One-quarter of a grain, diluted with starch, is a palliative in ERYSIPELAS of the pharynx.

One of the chief uses of morphine in the treatment of diseases of the respiratory passage is the alleviation of pain in LARYNGEAL PHTHISIS. It is also employed as a preliminary to the use of chromic acid in the interior of the larynx. Iodoform is the medium usually selected as an excipient, though it may be thrown upon the affected parts in any indifferent substance. From one-sixteenth to one-half a grain may be employed at a time. A few drops of the camphorated tincture of opium or an equivalent quantity of the watery extract in an ounce of water may be used as an anodyne in the form of a spray in CHRONIC LARYNGITIS.

Following upon an application of morphine to the larynx patients often complain of a sensation of dryness. It need not be of a grade sufficient to contraindicate the use of morphine, but it should always be in the mind of the physician, in order that remedies to overcome it may be available. The use of hot inhalations of benzoin, a spray of saturated solution of potassium chlorate, gargling with warm milk, etc., as a rule, suffices to relieve the distress. Morphine should be finely triturated to use in insufflation.

While morphine is a well known and effective agent for the relief of pain on the mucous surfaces, it should never be used on the vocal cords four hours before an exciting use of the organs of speech, as in preaching or singing. (Sajous.)

Morphine enters largely into the composition of lozenges in painful conditions of the throat and in laryngeal cough. Each lozenge contains from one-twenty-fourth to one-twentieth of a grain of morphine or one-tenth of a grain of the powdered opium or the extract. Lozenges of Dover's powder usually contain two grains of the essential ingredients. *Wistar's cough lozenge* is composed as follows: Powdered opium, one-tenth grain; oil of anise, one-thirty-second of a grain; extract of licorice, one grain. *Jackson's pectoral syrup* contains morphine and acacia. It probably acts in great part locally upon the inflamed structures about the aperture of the larynx.

MORPHINÆ ACETAS.

Diseases of the Eye.—Acetate of morphine is a convenient anodyne in ACUTE CONJUNCTIVITIS, combined with acetate of zinc or acetic acid or with both. Five grains of acetate of morphine, half a grain of acetate of zinc, and ten drops of dilute acetic acid to the ounce of water make an excellent wash.

CODEINA. Codeia. Codeine.

"An alkaloid prepared from opium. It occurs in white or yellowish white, more or less translucent, rhombic prisms, somewhat efflorescent in warm air. Odorless, having a slightly bitter taste and an alkaline reaction. It is soluble in eighty parts of water at 15° C. (59° F.) and in seventeen parts of boiling water. Very soluble in alcohol and in chloroform; also soluble in six parts of ether and in ten parts of benzol, but almost insoluble in benzin." (U. S. P.)

Diseases of the Throat.—Codeine is recommended by S. H. Chapman as an ingredient in the form of a troche. He exhibits the agent in the proportion of one-fiftieth of a grain in each lozenge in the presence of one-twenty-fifth of a grain of gum camphor and one-fourth grain of extract of glycyrrhiza.

ORIGANUM. Wild Marjoram.

Origanum vulgare. The oil of origanum exhibits properties in common with the other volatile oils.

The oil of wild marjoram is aromatic and stimulant.

Diseases of the Throat.—M. Mackenzie states that five minims to the ounce constitute a moderately stimulating inhalant. Oil of marjoram is not often used alone. It is sometimes combined with the impression of benzoin, lupulus, etc. S. H. Chapman exhibits the oil in the presence of an equal quantity of oil of thyme. A few drops are added to a pint of water, at 140° F., for inhalation in LARYNGITIS.

OVI ALBUMEN. OVI VITELLUS. Fowl's Egg.

Glyceritum Vitelli is official. (U. S. P.)

Both the albumen and the yolk of the fowl's egg are emollient and protectant. The shell may be used for the purposes for which chalk is ordinarily substituted.

General Surgery.—The "white of egg," either pure or mixed with wheat flour, when thinly spread over the surface and allowed to dry, forms an impervious coating resembling collodion, and, like it, when rendered aseptic, can be used for closing the external wound in compound fracture. It may also be used with gauze for holding together the edges of wounds, and in the absence of starch and plaster-of-Paris the albumen may be used in stiffening bandages. The roller is thoroughly saturated and applied in the same manner as in the case of plaster-of-Paris.

"White of egg," mixed with oil and water to form an emulsion, has been used as a topical dressing in the treatment of ERYSIPELAS and BURNS; coagulated with alum it forms "alum curd" (see p. 83), which may be used as an emollient and astringent application. The *yolk* is a soft, bland substance with a slightly alkaline reaction suspended in water. The yolk is commonly used as a vehicle for many substances (such as turpentine) in rectal medication. It is employed in *St. John Long's liniment.* The formula for this old preparation is as follows: Spirit of turpentine, one fluid ounce; vinegar, three fluid ounces; and the yolk of one egg. Placed in a bottle and thoroughly shaken it forms a creamy emulsion, with a peculiar but not unpleasant odor. This liniment is slightly rubefacient and is used as an embrocation for the chest in the BRONCHITIS OF CHILDREN. It should be rubbed in thoroughly with the hand before a fire. If a more marked effect than the one named is desired, a piece of flannel may be saturated and allowed to remain over the chest. This has a similar effect to that produced by the turpentine stupe.

Diseases of the Ear.—The thin membrane which lies between the egg-shell and the albumen has been used in the preparation of artificial "ear drums."

PAPAIN. Papayotin. Papoid. (The name Papayotin is also applied to the dried papaw juice, from which papain is prepared.)

The fruit of *Carica papaya*, or South American melon tree, yields a milky juice which, upon standing, separates into two layers. From the lighter of these is extracted, by precipitation with alcohol, the albuminous substance, papain. It has, in common with pepsin, the property of digesting fibrine. It is alleged that it acts best in alkaline solutions (pepsin acts only in acid solutions), and that it will peptonize two hundred times its own weight of fresh blood fibrine, and that seven grains of it will digest a pint of milk in an hour and a half.

Solutions, to be efficient, must be fresh or combined with non-toxic agents, having preservative powers, *e.g.*, glycerin, boric acid, camphor, etc.

Papain is a digestive solvent.

Diseases of the Skin.—Papain has been employed to prepare the skin, in ECZEMA PALMARUM, for the employment of other remedies. The following formula has been recommended:—℞. Papain, gr. xij; sodii biborat., gr. v; aquæ, f℥ij. M. To be painted on the thickened skin twice daily. When the epidermis is thoroughly softened it may be scraped, and other remedies (see *Pix, salts of mercury*, etc.,) applied. In this connection we do not think the drug offers any advantage over salicylic acid (*q. v.*) for the purpose above mentioned, and it is not so easily employed.

Diseases of the Ear, Throat, etc.—Johnston (*Edin. Med. Jour.*, January, 1890) recommends papain as a SOLVENT OF CERUMEN, in about the proportion of a scruple of the agent to an ounce of distilled water. Fifteen drops are instilled into the outer meatus, and an hour afterward the parts are syringed with a solution of boric acid. Papain, from its powerful properties as a solvent to moistened fibrine, has been recently employed (A. Jacobi, *Med. Record*, February 25, 1886) in removing the membranous exudate in DIPHTHERIA. E. L. Shurly (*N. Y. Med. Jour.*, September 11, 1886) is skeptical as to the effects of papain as a solvent in this disease. On the other hand, it is thought by J. C. Mulhall (*Trans. Am. Laryng. Assn.*, 1889) to be superior to trypsin.

Schwemmer (*Revue des Publications Médicales*, December, 1888) has had marked success with papain in the treatment of FISSURE OF THE TONGUE, after failure with chromic acid, nitrate of silver, and iodoform. He employs a solution of from one to two parts of papain to ten parts each of glycerin and water, applied five or six times a day, the fissures to be previously dried with a pledget of absorbent cotton. No maceration takes place, and the epithelium soon recovers. It has been used with benefit also in the treatment of SYPHILITIC ULCERATIONS OF THE TONGUE. A lozenge composed of Papain, gr. ⅛; cocaine, gr. ⅛; potass. bicarb., gr. ¼, is procurable.

LIQUOR PEPSINI. Solution of Pepsin. Liquid Pepsin.

"Saccharated pepsin, forty parts; hydrochloric acid, twelve parts; glycerin, four hundred parts; water, five hundred and forty-eight parts; to make one thousand parts. Dissolve the saccharated pepsin in the water, previously mixed with the hydrochloric acid, add the glycerin, let the mixture stand twenty-four hours, and filter. Solution of pepsin should be perfectly clear, of a slight yellowish color, and an agreeable, acidulous taste. It should not become mouldy, nor acquire a disagreeable, fetid odor, when kept for some time." (U. S. P.)

General Surgery.—An artificial digestive juice based upon the above has been employed by Norris (*N. Y. Med. Jour.*, Mar. 19, 1892) for the removal of dead bone and other neurotic tissue from suppurating tracts. An opening is made in the soft parts by the most direct route to the seat of disease. If it be possible the sinuses are made to connect and kept patulous by plugs of antiseptic gauze. A three per cent. solution of hydrochloric acid (*q. v.*) in distilled water is then injected. Should the patient be confined to bed, injections can be made every two hours during the day; under other conditions they may be made at bedtime. After decalcification of the exposed bone is accomplished the tracts are flushed with peroxide of hydrogen solution, or, in lieu of this, with one of bichloride of mercury, let us say 1-2000, and a preparation of pepsin, one-half drachm; hydrochloric acid, sixteen minims; distilled water, four ounces, employed. Digestion of the bone and tissue debris is completed in about two hours. The procedure is repeated at the end of two days.

PETROLEUM. Oleum Petras. Rock Oil.

Petroleum is an oily liquid, found at or near the surface in many parts of the world. It is usually of a dark-green color by reflected light, and reddish-brown by transmitted light, and is composed of hydrocarbons chiefly of the marsh-gas series.

By fractional distillation petroleum yields uncondensable gaseous products, rhigolene, gasoline, benzine, and kerosene; and there are obtained from the residues petrolatum, and paraffin.

Under the head of petroleum will be treated Rhigolene; Kerosene; Petrolatum; and Paraffin.

RHIGOLENE.

Rhigolene is a name given to the lighter distillates from petroleum, namely, those which boil at a temperature of about 65° F. It should be kept in a cold place in strong bottles, securely corked; the heat of the hand is more than sufficient to cause it to boil. It is most inflammable, and the highly diffusible vapor when mixed with atmospheric air is exceedingly explosive. It is a dangerous article, unless care is exercised with it.

Rhigolene is anæsthetic, refrigerant, and congelant. It is employed for feeding the Pacquelin cautery, although benzin answers the purpose as well.

General Surgery.—Rhigolene was introduced by W. B. Richardson, of London, as an excellent local anæsthetic. When sprayed on the skin it rapidly reduces the temperature to fifteen degrees; in this way cutaneous insensibility is obtained and facilities presented for the performance of minor surgical operations. It has not, however, been used as extensively as its merits deserve.

Diseases of the Nose.—Inflammatory reaction does not, in the judgment of W. C. Jarvis, occur when rhigolene is sprayed in the nasal chambers. A. Stabler (*Medical News*, Philadelphia, April 16, 1887) has recommended a mixture of rhigolene and oil as a vehicle for a spray. Two drachms of rhigolene (by measure) are added to the selected oil and sprayed upon the affected surfaces. The mixture is described as non-irritating, and in most cases acts as a mild anæsthetic. It possesses the advantage over pure rhigolene of being less ignitable. The following drugs are readily soluble: Balsam of copaiba, oil of cubeb, camphor, eucalyptol, iodine, iodol, iodoform, menthol (crystals), naphthalene (crystals), phenol (crystals), resorcin, oil of sassafras, salol, oil of turpentine, and thymol.

KEROSENE. Coal Oil.

Kerosene is protective and probably weakly antiseptic. Aided by friction to the skin it is also rubefacient.

General Surgery.—Kerosene has but a small field as a topical application in surgery. By saturating a flannel cloth and enveloping the skin over the affected parts, it is used in domestic medicine as a rubefacient in BRONCHITIS, PLEURISY, and RHEUMATIC PAINS about the articulations. Its action is similar to, although not nearly so active as, that of oil of turpentine. It usually conveys a sense of warmth and comfort to the part to which it is applied, causing redness of the skin without vesication. The disagreeable odor will prevent kerosene becoming popular. In railroad surgery it is a favorite dressing for fresh incised and contused WOUNDS, the injured part being enveloped in clean cotton-waste, over which kerosene is poured to saturation.

PETROLATUM. Cosmoline. Vaseline.

Under the names of cosmoline, vaseline, etc., there are sold various semi-solid hydrocarbons, obtained from the residue left after the manufacture of petroleum Wherever these words occur it is understood that petrolatum is the official synonym Petrolatum is obtained by the purification of the residuum from certain oils that have had the lighter portions (gasoline, kerosene, etc.) removed by distillation in a vacuum. This residue, on standing, becomes solid, and is purified by melting and passing through animal charcoal. Petrolatum is also obtained by purifying the solid substance which separates from certain crude oils while stored in large tanks. The title, *Petrolatum* (U. S. P.), is intended to do away with these many names and to cover a product which shall be equivalent to all of them. As defined by the U. S. P., petrolatum is "a semi-solid substance consisting of hydrocarbons, chiefly of the marsh-gas series ($C_{16}H_{34}$, etc.), obtained by distilling off the lighter and more volatile portions from American petroleum and purifying the residue. Melting point about 40° to 51° C. (104° to 125° F.), the first constituting the softer, and the second the firmer variety. When petrolatum is prescribed or ordered without specifying its melting point, the low melting variety, which liquefies at 40° C. (104° F.), is to be dispensed." The Pharmacopœia further describes it as "a yellowish or yellow fat-like mass, transparent in thin layers, more or less fluorescent, especially when melted, completely amorphous, tasteless, and odorless, or giving off at most only a faint petroleum odor when heated, and having a neutral reaction. It is insoluble in water, scarcely soluble in alcohol, or in cold, absolute alcohol, but soluble in sixty-four parts of boiling absolute alcohol, and readily soluble in ether, chloroform, disulphide of carbon, oil of turpentine, benzin, benzol, and in fixed or volatile oils." The Ph. Br. contemplates a purer product, and describes it as being of a white color and free from odor, even when heated.

Petrolatum is a bland and unirritating unguent, and is often employed as a substitute for lard in the preparation of ointments. It is stated by the manufacturers that it is unalterable when exposed to the air. Such, however, is not the case, as exposure will cause it to acquire a disagreeable coal-tar odor.

Cosmoline and vaseline are trade names for forms of petrolatum. While slight differences obtain between these two articles for most purposes in the practice of medicine, they are similar substances. Both words are in this country in general use.

Some authorities have asserted that petrolatum is unabsorbable and therefore not well adapted to this purpose; but Luff ("Revue Internat. de Bibliograph. Méd.," January 25, 1891), as the result of a series of experiments, claims that it forms the best ointment for the promotion of absorption. Iodide of potassium applied externally, when mixed with cosmoline, appeared in the urine in an hour; when mixed with lard, in nine hours, and when mixed with lanolin, not at all. Similar comparative results were obtained with carbolic acid and with resorcin.

General Surgery.—Vaseline is used in surgical practice as a substitute for lard as a basis for making ointments, especially with substances like the salts of lead, mercury, and zinc, and iodide of sulphur, which make lard rancid.

Liquid cosmoline, obtained from the residue after incomplete distillation of petroleum, is a valuable substitute for sweet oil for anointing sounds, catheters, and uterine instruments, as it is not liable to become rancid. Vaseline is also largely used to anoint instruments. As a basis for ointments it is for the most part inferior to lard or lanolin. It is a protectant to cutaneous surfaces, to prevent maceration from the prolonged use of poultices, water dressings, or on wounds where irrigation is being used. It is largely used by professional swimmers to smear over the body, to protect the skin before entering the water. It is valuable to anoint the hands and fingers in making post-mortem examinations of the thoracic and abdominal cavities to prevent septic material from finding its way into small cracks or fissures in the skin. In the same way it is valuable in making digital, rectal, and vaginal examinations in persons suffering from syphilis. Cosmoline may be incorporated with crystals of carbolic acid in the strength of a drachm to the ounce. In Burns, plain vaseline has long been in use, and as a simple, bland, non-irritating dressing, is applied spread on lint or old linen, or thickly spread over the part. We consider it inferior to zinc or boric ointment as a topical application in these conditions. It is a soothing dressing for Superficial Burns in the following ointment: ℞. Sodii bicarb., ʒj; cosmoline, ℥j. Cosmoline is a favorite domestic remedy for superficial wounds, abrasions, and contusions, and is applied directly to the affected part. Cosmoline is a useful substance for anointing bright steel surgical instruments to prevent rusting.

In the treatment of Erysipelas, where an unguent is desired, cosmoline is to be preferred, as it interferes less with the cutaneous function.

Diseases of the Skin.—Vaseline is of a consistence which renders it available in dermatological practice.

Much controversy has arisen as to the relative penetrability into the skin of lard, petrolatum, and lanolin. None of the experiments thus far made are conclusive. There is practically little difference between these different vehicles.

The comparative tenuity of vaseline renders it convenient to use as an excipient in the preparation of unguents for the scalp. Otherwise it possesses no particular advantages over lard. An ointment of equal parts of vaseline and oxide of zinc ointment is convenient for use in cold weather.

Diseases of the Eye.—Cosmoline is extensively used for ointments, particularly of yellow oxide of mercury, intended to be applied to the cornea. Cosmoline is unirritating, and is often applied to the edges of the eyelids at night to prevent their adhesion by the accumulation and drying of conjunctival discharges. Spread on linen or gauze, it is placed next the eye, under compresses, to facilitate their removal. F. M. Wilson, of Bridgeport, Connecticut, commends its use in Gonorrhœal Ophthalmia, and claims that it not only gives comfort to the patient, but diminishes the discharge and facilitates its escape from the eye. It should be used frequently and introduced freely beneath the upper lid, so that the ball is bathed in it.

PETROLATUM LIQUIDUM. Liquid Petrolatum. Oleum Petrolatum. Liquid Vaseline. Paraffinum Liquidum. "Albolene." "Benzoinol (!)."

Liquid petrolatum is in extensive use as a medium for dissolving many medicaments when for any reason it is designed to employ a liquid in preference to a solid fatty medium. It might be defined to be a liquid ointment base. In the development of the local therapeutics of the respiratory tract liquid petrolatum holds a prominent place. It forms the basis of applications made in the form of a spray. In spraying oily fluids (especially liquid petrolatum and castor oil) it is imperative that a sprayer made expressly for the purpose be used. A number of ingenious models have been introduced into the trade.

Petrolatum Liquidum is an oily fluid, obtained by distilling off the lighter portions of certain kinds of petroleum in a vacuum, and purifying the residue with animal charcoal. Its composition is similar to petroleum, except that the hydro-carbons have a lower boiling point. They are liquid at ordinary temperatures.*

PARAFFIN.

Paraffin is one of the many by-products from the residues after the distillation of coal oil. In the pure state it is a white, waxy substance, midway in density between wax and tallow. Its melting point varies, depending, as it does, largely upon the temperature at which it has been prepared.

General Surgery.—Paraffin is employed in surgery in the same manner as wax; owing to its cheapness, it is supplanting wax in many ways. When it is necessary to protect substances from the action of the air, paraffin is often employed. Tissue paper coated with paraffin is extensively used as an impervious protection to prevent evaporation in wet surgical dressings, and has largely superseded the use of oiled silk. Paraffin is often added to ointments to give consistency in hot weather. Owing to the rapidity with which it cools, paraffin is sometimes applied in a liquid state to inject CYSTS which have become ruptured or have been punctured and their contents evacuated. The cysts are re-distended by being injected with the paraffin, which, on cooling, affords a good opportunity for the careful dissection of the cyst-wall.

Diseases of the Skin.—Paraffin is used chiefly as an adjuvant to give ointments a stiff consistence. The following formula for the treatment of ECZEMA PLANTARUM will serve as an example: ℞. Acid. salicylic, paraffin, āā ʒij; ceræ albæ, ʒj; olei amygdalæ dulcis, fʒiijss. M. This makes a firm preparation which can be spread like plaster upon muslin.

Paraffin paper is employed very extensively in dermatological practice. It is soft and pliable, does not fissure very easily, and can be applied to the most irritable skin without danger. Ointments and even soft plasters may be spread upon paraffin paper, which being cleanly and efficient, should almost always be preferred to cloths in applying ointments. As the ointment is not absorbed by the paraffin paper, it exercises all its virtue upon the skin instead of being partly wasted.

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* "Terraline" is a trade name for a form of petroleum, intermediate in consistence between petroleum and liquid petrolatum.

PHENACETINUM. Phenacetine.

A crystalline substance produced by the action of glacial acetic acid on para-phenetidine; the latter is obtained from phenol. In constitution phenacetine is closely allied to acetanilide. Phenacetine occurs in colorless, tasteless, inodorous, glistening, scaly crystals. It is sparingly soluble in cold water, more freely soluble in boiling water, and soluble in about fifteen parts of alcohol.

Diseases of the Nose.—S. Johnston employs phenacetin as an ingredient of a powder in which subcarbonate of bismuth and powdered acacia enter, in the treatment of ACUTE RHINITIS.

PHYSOSTIGMA. Calabar Bean. Ordeal Bean.

"The seed of *Physostigma venenosum*." (U. S. P.) Physostigma is the source of the alkaloids known under the names of *Eserine*, or *Physostigmine*, and *Calabarine*. The existence of the last is questionable. Eserine occurs in colorless tabular crystals, which are readily soluble in ether, alcohol, chloroform, and sparingly soluble in water. The *Sulphate of Eserine* or *Physostigmine* is the form in which it is usually used, though the salicylate is official. The sulphate is freely soluble in water, while the salicylate requires 130 parts of water to dissolve it.

Physostigma is reputed to increase the secretion of the salivary glands, skin, and mucous surfaces generally. Eserine is a powerful excito-motor agent when applied to the eye.

ESERINE.

Diseases of the Eye.—Eserine causes contraction of the pupil and spasm of the ciliary muscle by its property of stimulating unstriped muscular fibres. It temporarily diminishes the mydriasis resulting from pathological or experimental paralysis of the third nerve, and increases the myosis due to paralysis of the sympathetic. Its effects are more temporary than those of the stronger mydriatics, and when the latter are overcome by its use they subsequently reassert themselves. In *complete* ciliary paralysis by atropine and in the mydriasis induced by hyoscine eserine has no effect. (Jessop.)

Eserine begins to contract the pupil and to cause accommodative spasm in about five minutes, and reaches its maximum effect in from twenty to forty-five minutes. Its effect on the accommodation lasts only a few hours, in the pupil rather longer, sometimes several days.

In strong solutions it causes pain in the eye and head, ciliary congestion, twitching of the orbicularis, and occasionally spasm of the external muscles; if constitutional effects have been induced, giddiness and faintness are added to these symptoms. The sulphate is the form most in use. Its solution becomes red after standing for a time and loses some of its efficacy. The salicylate is said to be more permanent. It is usually prescribed in solutions of from one-tenth of a grain to a grain to the ounce. For continued use even weaker solutions are sometimes preferred, but when a rapid and decided effect is sought, two or four grains may be needed. The susceptibility to its unpleasant effects varies greatly in different individuals.

Pflüger states that eserine increases the intraocular tension of a normal eye, but that it diminishes tension in the early stages of GLAUCOMA is universally admitted. (See article on Atropine.) It is not to be compared in this respect to iridectomy or sclerotomy, and has little effect in advanced stages of the diseases when the paralyzed muscular fibres of the iris fail to respond to it; but will sometimes check the commencement of an acute attack, and should always be used when for any reason an operation must be avoided or postponed. When it fails to contract the pupil, it may do harm by increasing the flow of blood to the iris and inducing irritating spasm of the ciliary muscles. Some authors have advised against its use in the hemorrhagic form of glaucoma. It is often used after cataract extraction, particularly without iridectomy, to withdraw the iris from the wound, and for the same purpose is indicated in peripheral perforation of the cornea from ulceration or puncture. It has been recommended in weak solutions in some cases of accommodative ASTHENOPIA without refractive errors, or after these have been carefully corrected. In PARALYSIS OF ACCOMMODATION and PARALYTIC MYDRIASIS its effect is temporary, lasting only a few hours, and with little tendency to permanent result, as it stimulates the periphery of the nerve fibres, but does not reach the cause of the trouble, which usually lies further back. Ability to read may be temporarily restored, but generally convex glasses answer this purpose better.

In some cases of ULCER OF THE CORNEA and of sloughing KERATITIS eserine produces prompt improvement when atropine has failed. Much discussion has arisen as to the comparative merits of these apparently opposite remedies, but the indications for the use of one rather than the other are not yet definitely formulated. It may, however, be concluded that eserine is not usually well borne when there is acute inflammation, or much ciliary irritation, and that it is to be avoided if the corneal disease is complicated with iritis. Increased intraocular tension is an indication for its use.

PILOCARPUS. Jaborandi.

"The leaflets of *Pilocarpus pennatifolius*." (U. S. P.) The single official preparation is a fluid extract (Extractum Pilocarpi Fluidum), one cubic centimetre representing the activity of one gramme of pilocarpus. Pilocarpus owes its activity to an alkaloid, *pilocarpine*. The hydrochloride is official (U. S. P.); it is soluble in less than two parts of water. In the Br. Ph. the nitrate is official; it is soluble in eight or nine parts of water.

Diseases of the Skin.—The fluid extract of jaborandi has been used as an application in ERYSIPELAS. We have employed it in the following formula, but without marked success: ℞. Ext. jaborandi fluid., f℥iij; tinct. opii, glycerini, āā f℥ss. M. Sig.—Paint over the affected parts every four hours.

In ECZEMA the fluid extract has also been used alone as a local application with success.

Both jaborandi and pilocarpine have been used locally in the treatment of ALOPECIA, but the accounts of their value have been too vague to be satisfactory. In some cases this remedy has been combined with some other application of well-proved value, as tincture of cantharides, and the favorable result has been credited to the pilocarpine in jaborandi, an entirely unjustifiable deduction.

Diseases of the Throat, etc.—Pilocarpine has lately come into use as an internal remedy for conditions in which a diminution of normal secretion is a pathological factor. J. C. Dunlop (*Brit. Med. Jour.*, June 7, 1890) has proposed its employment as a hypodermic injection for mixed middle ear and labyrinthine disease of long standing. The reputed value of the agent, when thus employed, has led observers to search for a local use as well.

Gomez de la Mata (*Gazeta de Oftalmologia, Otologia y Laryngologia*, July, 1886) recommends pilocarpine to be used, either pure or mixed, with glycerin, carbolic acid, to promote detachment of the false membranes in DIPHTHERIA. Woltering (*Monatschrift f. Ohrenheilk*, July, 1886) suggests the subcutaneous injection in ŒDEMA OF THE GLOTTIS.

Pilocarpine, in the proportion of one-fortieth of a grain to each mass, has been used in the form of a lozenge for the relief of dryness of the throat. The drug acts by increasing the amount of mucus. Care must be taken not to confound the sensation of dryness for the actual desiccation of the membrane, since patients frequently complain of the throat being dry when in truth its surface is covered by excess of secretion. J. Solis-Cohen uses one to five minims of the fluid extract of jaborandi to the ounce of water as a spray to the larynx in inflammation accompanied with diminished secretion.

Diseases of the Eye.—The hydrochloride of pilocarpine is a decided myotic, but much milder in its action than is eserine. It is unirritating, and some authorities claim that it is entirely free from the tendency to produce iritis which sometimes forbids the use of eserine. It has no noticeable effect upon the thoroughly atropinized eye, and is not depended upon as a remedy in glaucoma, but is useful when a gentle and prolonged stimulation of the ciliary muscle is desired, as in CILIARY PARESIS and in cases of accommodative ASTHENOPIA which are free from refractive error or in which the asthenopia persists after such error has been properly corrected. It is used in solution of from two to five grains to the ounce.

PINOL.

A trade name used to designate the oil of the leaf of *Pinus Pumilio.* It possesses qualities similar to the oil of Pinus sylvestris (*q. v.*).

Diseases of the Throat, etc.—Pinol is used for inhalation in the treatment of CHRONIC and SUBACUTE LARYNGEAL and PHARYNGEAL CONDITIONS.

PINUS CANADENSIS. Hemlock. Hemlock Spruce.

Hemlock, or Canada pitch, is "the resinous exudation of *Abies canadensis.*" (U. S. P.) In addition the bark abounds in tannic acid, and contains also a notable proportion of a volatile oil (the oil of spruce, oil of hemlock). Emplastrum Picis Canadensis (U. S. P.) is composed of Canada pitch, nine parts, and yellow wax, one part. An extract of the bark is also in use.

Hemlock is astringent and stimulant.

Diseases of the Throat, etc.—T. F. Rumboldt (*St. Louis Archives*, 1873) used the extract of Pinus canadensis in the strength of one-half drachm to two drachms to a carbolic acid solution, in the strength from two to five grains to the ounce, for an astringent action where the mucous secretions are abundant and the membranes lack tone. A lozenge of the extract of Pinus canadensis is in the market. Each mass contains one grain of the preparation.

PIPER. Pepper. Black Pepper.

"The unripe fruit of *Piper nigrum.*" (U. S. P.) The powder known as "black" pepper is procured by powdering the whole unripe berry. "White" pepper is made from the ripe berry. Pepper contains an oleoresin, an alkaloid (piperine), a volatile oil, gum, and extractive matter. Of these the alkaloid and oleoresin are official. The latter is made by exhausting pepper with stronger ether, and distilling or evaporating the ether. Preparations of black pepper, free from adulteration, are difficult to obtain.

Pepper is stimulant.

General Surgery.—Pulverized pepper, when rubbed on the skin, increases the circulation; it is sometimes added to sinapisms. In old people who suffer from COLD EXTREMITIES a small amount of ground pepper is worn in the stocking with comfort.

Diseases of the Throat, etc.—Pepper is used by Mandl in INFILTRATION and ELONGATION OF THE UVULA and in PARALYSIS and FUNGOUS STATES OF THE TONGUE. Potter mentions a pepper plaster which is recommended to be worn about the neck or chest as a means of inducing mild counter-irritation.

PIX BURGUNDICA. Burgundy Pitch.

"The prepared resinous exudation of *Abies excelsa* (Norway spruce)." (U. S. P.) Burgundy pitch is also obtained from *Abies picea* (European silver fir). Pix Burgundica is a constituent of *Emplastrum Ferri*, *Emplastrum Galbani*, and *Emplastrum Opii*. *Emplastrum Picis Burgundicæ* is made by taking nine parts of Burgundy pitch, one part of yellow wax, melting them together, and straining. *Emplastrum Picis cum Cantharide* (warming plaster) is made by taking ninety-two parts of Burgundy pitch and eight parts of cerate of cantharides, melting them together, and straining.

Burgundy pitch is slightly stimulant and rubefacient. It is rarely vesicant.

General Surgery.—When applied to delicate skins Burgundy pitch produces a papillary eruption, and by prolonged use may excite vesication and ulceration. Even when not exciting irritation, it may cause intolerable itching. Emplastrum Picis Burgundicæ is extensively employed for a variety of chest pains, as the result of "cold," and is especially serviceable in protecting the chest from the danger of atmospheric changes complained of by persons suffering from PHTHISIS. In LUMBAGO and CHRONIC RHEUMATIC PAINS a pitch plaster worn over the affected part is often of service and a source of comfort to the patient.

PIX LIQUIDA. Tar. Wood Tar.

"An empyreumatic oleoresin obtained by the destructive distillation of the wood of *Pinus palustris* and of other species of *Pinus*." (U. S. P.) By distillation tar yields pyroligneous acid (see Acidum Aceticum) and oil of tar (which also see); it contains a great variety of compounds, of which creasote is one. Tar is soluble in the volatile and fixed oils, in solutions of potassa or of soda, in ether and in alcohol. Unguentum Picis Liquidæ (tar ointment) is made by melting together equal parts of tar and suet and straining.

Tar is mildly antiseptic, discutient, stimulant, astringent, parasiticide, and antipruritic. On the hypertrophied epidermis of PSORIASIS and CHRONIC ECZEMA tar has a dissolving effect to a certain extent, and also to a slight degree a "keratoplastic" influence; that is, it favors the growth of healthy epidermis.

Under the caption of *tar* will be considered Oleum Picis Liquidæ and Tar Water.

OLEUM PICIS LIQUIDÆ. Oil of Tar.

"A volatile oil distilled from tar." (U. S. P.) It has the odor and taste of tar, and unless recently made is of a dark reddish-brown color. The preparations sold under the name of oil of tar probably owe their efficiency to the creasote they contain.

Oleum cadini (*q. v.*), is derived from the juniper tree of France; and *Oleum rusci*, or oil of birch, is derived from the white birch of Russia.

There is little or no difference in the medicinal effect of these various forms of tar, but some are thought to have a more agreeable odor than others.

Diseases of the Skin.—The external uses of tar in the treatment of skin disease has been known since ancient times, and during the greater part of the present century it has been, next to sulphur and mercurial preparations, perhaps the most commonly employed of all cutaneous remedies. Of late years some of the derivatives of coal tar have replaced it on account of its disagreeable qualities, but there are certain virtues in the tarry preparations which are not possessed by more agreeable remedies and which recommend them in a number of skin affections.

Wood tar is chiefly employed in medicine, although coal tar, "picis mineralis," enters into one preparation, at least, of considerable value, "liquor carbonis detergens." *

In the treatment of CHRONIC PSORIASIS the scaly patches are cleansed with soap, or, if numerous, by a hot bath, and the pure liquid tar (pix liquida) is rubbed into each one thoroughly every day. Sometimes an ointment of a drachm or more of pix liquida to the ounce of lard is employed in the same way. Occasionally the tar is combined with sulphur, a drachm of each to the ounce of lard. The well-known "*Wilkinson's ointment*," as modified by Hebra, is composed as follows: ℞. Sulphur. præcip., picis liquid., āā ʒvj; saponis viridis, adipis, āā ʒxvj; pulv. cretæ, ʒiv. M. This is an excellent local remedy in psoriasis and is also employed in SCABIES. It should be used diluted at first on tender skins.

In CHRONIC ECZEMA tarry preparations are highly useful. The formulæ given above may be ordered, or, in milder cases, an ointment substituted of half a drachm to a drachm of tar to the ounce of oxide of zinc ointment. (*Vide infra.*) In the CHRONIC ECZEMA OF CHILDREN an ointment of half a drachm of liquid tar, or of oil of cade with half a drachm of precipitated sulphur in an ounce of oxide of zinc ointment, forms an admirable application.

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* For a considerable portion of the earlier part of this article we are indebted to an excellent paper by Bulkley ("The Local Use of Tar, etc." *Archives of Sci. and Pract. Med.*, April, 1873).

The liquid preparations of tar are very convenient for use in many cases of Chronic Eczema. They may be easily diluted to any degree, and therefore may be employed in more acutely inflammatory conditions than the stronger ointments above mentioned. It is to be remembered, however, that tar and tarry preparations are rarely, if ever, to be used in acute eczema.

A solution of tar, with caustic potassa, introduced by Bulkley under the name of "liquor picis alkalinus," is an admirable application in Chronic Papular Eczema, especially when diffused over large surfaces. It is composed as follows: ℞. Picis liquidæ, ʒij; potassæ causticæ, ʒj; aquæ, f℥j. M. This is much too strong to be used undiluted except in the rarest cases, as it is almost caustic. For ordinary use one ounce of this solution may be diluted with fifteen ounces of water,—this may be strengthened or weakened, as the case may require.

A somewhat more elegant tarry preparation is the "*liquor carbonis detergens.*" It is a proprietary preparation, but is closely imitated by the following formula:—℞. "Picis mineralis," ʒij; alcoholis, f℥ij; strain and add liq. ammoniæ fort, ♏viij; glycerini, fʒvj; aquæ destillatæ, ad. f℥xij. M. It may be employed in full strength or diluted.

Another liquid preparation of tar is the following: Picis liquidæ (or ol. cadini), ʒj; collodii, f℥j. M.

This preparation should be put in a tightly-stopped bottle, with a camel's hair brush inserted in the cork, for convenience of application. Painted on small patches of sub-acute or chronic eczema, the collodion quickly dries and forms a protective covering, while the tar acts as an antipruritic. This preparation is of peculiar value in Infantile Eczema, especially of the face, when it may be used even in acute cases. The application gives momentary pain, but afterward great relief, and, unlike an ointment, it cannot be rubbed off by the struggles of the child.

It should not be applied near the eye, and the physician should make the first application with due precautions against ignition. The application leaves a light-brown stain, which is objected to at times by vain parents, but it is so superior to other forms of treatment that it is by all means to be preferred.

Tar may be combined with mercurial preparations in some cases with advantage. An ointment of ten to twenty grains of the yellow oxide of mercury, a drachm of oil of cade, and an ounce of oxide of zinc ointment forms an excellent application in small patches of chronic eczema with infiltration. It is to be rubbed in in small quantity very firmly.

The tarry preparations are of value in Pruritus. The various formulæ given above may be employed, but the lotions are preferable.

As a parasiticide tar is not of great value; it is usually combined with iodine (*q. v.*) or some other alterative.

Diseases of the Nose, Throat, etc.—The vapor of oil of tar may be used in the treatment of ACUTE CORYZA. It can be also prescribed as an inhalant in any of the conditions in which creasote is indicated. Ten minims may be added to a half ounce of water to which ten grains of magnesium carbonate have been added. It is a useful preparation when inhaled in proportions of one teaspoonful of the mixture to a half pint of water at 150° F. The following may be substituted: Oil of tar, half a drachm; liquid petrolatum, one ounce. Inhale. A. S. Houghton. (*Jour. Am. Med. Ass'n*, November 7, 1885.)

Oleum picis in the proportion of one drachm to six ounces of liquid petrolatum is used by Shurly. Directions are given to mix these ingredients by the aid of gentle heat, and filter. One drachm each of the oil of tar and bicarbonate of sodium added to a pint of boiling water is a useful spray in irritation of the respiratory passage. The water and oil of tar should be first mixed and allowed to boil three minutes; after the mixture is cool the bicarbonate of sodium is added and the whole filtered.

Lozenges of tar contain one to seven grains in each mass. Various combinations of tar and expectorants are to be found in the trade.

Oil of tar is sometimes prescribed in the form of a lozenge, in the proportion of one-half minim to each mass.

TAR-WATER. Aqua Picis Liquidæ.

Diseases of the Throat, etc.—Tar-water may be used in the form of tar-water, glycerole, or vapor.

As a spray in CHRONIC LARYNGITIS, LARYNGEAL PHTHISIS, and CHRONIC PHARYNGITIS and LARYNGITIS tar-water forms an admirable adjuvant with borax, boric acid, or resorcin. Moure (*La Tribune Médicale*, 1889) has revived its use in OZÆNA, and presents the special claim of its value when combined with small proportions of Lugol's solution and camphor.

The vapor inhalation of tar has long been of use in ACUTE INFLAMMATION OF THE LARYNX AND PHARYNX. The use of tar in disinfecting the sick-chamber in DIPHTHERIA is secured by J. C. Mulhall (*Trans. Amer. Laryng. Ass'n*, 1889) in the following manner: A gas stove is introduced into the room which will hold two vessels. Into each is poured a half gallon of water. Into each of these in turn a half pint of pine tar and a tablespoonful of oil of turpentine is stirred. As steam is generated water is occasionally added, so that the half-gallon mark is maintained. The amount of tar will be sufficient for the entire treatment, but to each vessel there is added every hour a tablespoonful of the oil of turpentine. This treatment is credited to be unassociated with strangury. The room selected for the fumigation should be previously disinfected with sulphur. Mulhall accredits this plan in its essential details to Delthil.

PLUMBI ACETAS. Acetate of Lead. Sugar of Lead.

"Colorless, shining, transparent, prismatic crystals or scales, efflorescent and attracting carbonic acid on exposure to air; having a faintly acetous odor, a sweetish, astringent, after-metallic taste, and a faintly acid reaction; soluble in one and eight-tenths parts of water and in eight parts of alcohol at 15° C. (59° F.)." (U. S. P.) Because of the facility with which subacetate of lead is decomposed, it is used in medicine only in solution. *Ceratum Plumbi Subacetatis* (Goulard's cerate) contains twenty parts of solution of subacetate of lead, with camphor cerate enough to make one hundred parts. (A more soothing application would be one in which the camphor is omitted.) *Linimentum Plumbi Subacetatis* is made by mixing forty parts of solution of subacetate of lead with sixty parts of cotton-seed oil. The official preparation is the *Liquor Plumbi Subacetatis* (Goulard's extract), which is a concentrated solution of subacetate of lead; from this is made *Liquor Plumbi Subacetatis Dilutus* (lead-water) by taking three parts of the stronger solution and distilled water sufficient to make one hundred parts, or one fluiddrachm of liquor plumbi subacetatis, and distilled water, five fluidounces. The difference in strength of these two preparations, and the similarity of their names, make it necessary that they should be carefully distinguished.

Acetate of lead is astringent and sedative. It reduces hyperæmia and lessens inflammatory action. It must be remembered that concentrated solutions of the subacetate are irritant.

General Surgery.—Solutions of the subacetate of lead have long been employed as topical applications in external acute inflammations. Although chemically incompatible, they are associated with opium, forming the well-known "lead-water and laudanum," so generally used for the treatment of SPRAINS, CONTUSIONS, and SUPERFICIAL INFLAMMATIONS. According to authorities, its application is contra-indicated where the skin is broken, as absorption is likely to occur. From an extensive use of the preparation, we are inclined to place little dependence upon this statement, and consider the combination one of the best which can be made in SEVERE CONTUSIONS or sprains accompanied with laceration, a condition constantly occurring in dispensary practice. Lint or old linen rags are saturated in the solution (excess of fluid being squeezed out) and the affected part covered to prevent evaporation, and the whole is retained in position by a bandage. The effect produced in twenty-four hours is marked. For incised, lacerated, or contused wounds other forms of dressing are preferable. In ERYSIPELAS relief will be secured, according to Agnew, by the application of lead-water and laudanum to the affected part. An ounce each of laudanum and the solution of the subacetate of lead and enough water to make a pint is commended. In GONORRHŒA acetate of lead is extensively employed, either alone or in conjunction with other astringents. It is used at the Pennsylvania Hospital in combination with sulphate of zinc. The following will be found useful:—℞. Plumbi acet., zinci sulph., āā gr. xij; tinct. opii., f℥j; aquæ,

q. s. f℥vj; diluted if necessary at first. In CHRONIC CYSTITIS Sir Henry Thompson regards warm solutions of the acetate of lead (one-fourth grain to the ounce), when the urine is alkaline, as one of the best of mild injections. Goulard's extract, or the solution of the subacetate of lead, resembles closely the acetate. As before stated, it is largely employed in making lead-water and laudanum. Equal parts of the extract and laudanum form a convenient means of dispensing; water may be added as required. A poultice is made by saturating the crumbs of stale bread in Goulard's extract; it is applied cold. The official *liquor plumbi subacetatis dilutus* is too weak to be of much service. SYPHILITIC WARTS and small vegetations often wither slowly and painlessly under a daily application with a camel's hair brush of Goulard's extract. Equal parts of extract of hyoscyamus and Goulard's cerate form an ointment which can be applied gently with the finger to HEMORRHOIDS after the parts have been bathed with warm water. This preparation was a favorite with the late Prof. Carson, of Philadelphia.

Diseases of the Skin.—Dissolved in water, in the proportion of two to three drachms to the pint (with the addition of a drachm of dilute acetic acid if the solution be desired clear), the acetate of lead forms an excellent sedative and astringent lotion in HYPERIDROSIS, BROMIDROSIS, and in ACUTE ECZEMA, ERYSIPELAS, DERMATITIS, PRURITUS VULVÆ, and all acute inflammatory diseases of the skin. It is not so satisfactory a sedative, however, as is the solution of the subacetate of lead. "*Burow's liquid*" is composed of five grains of alum, twenty-five grains of acetate of lead, and five hundred grains of distilled water.

The acetate of lead is sometimes employed in the form of an ointment. In DERMATITIS CALORICA, or CHILBLAIN, the following soft ointment has been used to advantage: ℞. Plumbi acetat., ℈iiss; ceræ flavæ, ʒiss; ol. rapi., f℥j; ovi. vitell., j. M.

An excellent ointment, when palm oil can be procured of the best quality, is the following: ℞. Plumbi subacetat., gr. v; pulv. zinci oxidi, gr. x; hydrarg. chlor. mitis, gr. v; ung. hydrarg. nitrat., gr. x; ol. palmæ, ʒij; ung. adipis benzoinat., ℥ss. M. Although the acetate of lead is only one of several ingredients, this seems the proper place to introduce this excellent combination. It is slightly stimulant, and is useful in SUBACUTE and CHRONIC ECZEMA.

The subacetate of lead is more decidedly sedative than the acetate, and is therefore generally useful. In the form of *liquor plumbi subacetatis* it must generally be diluted with water, or employed as the *liquor plumbi subacetatis dilutus*.

Glycerole of the subacetate of lead was suggested by Squire. It is an excellent remedy when diluted with glycerin, or used as an ointment (one-half to one drachm to the ounce of lard) in ECZEMA OF THE LEG. The glycerole of lead contains one hundred and seventy-two grains of the acetate to the ounce. It should be diluted with four parts or more of glycerin before being used.

In Eczema of the Eyelids Mittendorf employs, after removing the crusts with oil and warm water, a lotion of six drops of the liquor plumbi subacetatis in half a tumbler of water, applied five or six times a day, for five minutes at a time. This is used in connection with the ointment of the yellow oxide of mercury mentioned under hydrargyri oxidum flavum.

The "lead water and laudanum" of hospital use is composed of: ℞. Liq. plumbi subacetatis dilut., f℥j–f℥iij; tinct. opii, f℥ij–f℥iv; aquæ, *ad* Oj. M. This is employed in all acute inflammatory diseases of the skin, particularly in Dermatitis Venenata.

Diseases of the Ear, Nose, and Throat.—The acetate of lead is used in the treatment of Eczema of the external ear, in the form of ointment. W. B. Dalby approves of the liquor plumbi subacetatis in the treatment of granulations on the tympanic membrane or within the tympanic chamber. It is important to remember that a deposit takes place, and it is best not to direct a treatment to be conducted for a long time.

In the proportion of two grains to the ounce of indifferent material acetate of lead can be insufflated in the treatment of Purulent Rhinitis of children. Twenty to thirty minims of the weaker solution to the ounce of water forms an astringent lotion for the larynx and pharynx. Schnitzler employs acetate of lead in the local treatment of Tubercular Ulcerations of the larynx. The dilute solution of the subacetate of lead is commonly used in the affections of the upper air tract in the form of a glycerole. Toothache may sometimes be immediately relieved by inserting one or two grains of the acetate of lead into a carious tooth.

Diseases of the Eye.—Acetate of lead was formerly much used in collyria for Conjunctivitis, and has been recommended as a remedy in Trachoma, rubbed, in fine powder, into the conjunctival surface of the lid. It is, however, a dangerous remedy, from its liability to form insoluble deposits, if there are ulcers of the cornea, and its use has been generally abandoned. The liquor plumbi subacetatis is a useful application in the treatment of acute inflammation of the skin of the lids, particularly in cases of Rhus Poisoning. It may be used in the proportion of an ounce to a pint of water.

PLUMBI CARBONAS. Carbonate of Lead. White Lead.

"A heavy, white, opaque powder or pulverulent mass, permanent in the air, odorless, tasteless, and insoluble in water or alcohol." (U. S. P.) The single official preparation is the *Unguentum Plumbi Carbonatis*, which is made by rubbing ten parts of carbonate of lead, in very fine powder, with ninety parts of benzoinated lard. When ground with linseed oil, carbonate of lead forms the familiar substance known as "white lead," which is used as a paint.

Carbonate of lead is sedative, astringent, and protectant.

General Surgery.—"White lead" forms an admirable dressing for the treatment of small, inflamed, and excoriated surfaces, protecting them from the action of the air by forming an impervious coating. In BURNS and SCALDS carbonate of lead was a favorite dressing with the late S. D. Gross. It is used pure or brought to the consistence of cream with sweet oil. It is of easy application. Care must be exercised that too large a surface is not covered, as toxic absorption may result. Rawlins (*Med. News*, October 5, 1889), reviving the methods of Freer, speaks highly of carbonate of lead in the treatment of ERYSIPELAS, when painted over the inflamed as well as the adjacent healthy skin. He states that it promptly relieves pain and tends to limit the spread of the disease.

Diseases of the Skin.—The powder of carbonate of lead is sometimes used as a local sedative and astringent in ACUTE INFLAMMATORY CONDITIONS OF THE SKIN.

Diseases of the Ear.—White lead is a valuable remedy for INFLAMMATION OF THE EXTERNAL AURICLE, especially when the attack ensues upon exposure to cold.

PLUMBI IODIDUM. Iodide of Lead.

"Iodide of lead is a heavy, bright citron-yellow powder, permanent in the air, odorless and tasteless, and of a neutral reaction. Soluble in about 2000 parts of water at 15° C. (59° F.), and in about 200 parts of boiling water; very slightly soluble in alcohol, but readily dissolved by aqueous solutions of the acetates of alkalies and by solutions of chloride of ammonium." (U. S. P.) An ointment is official.

General Surgery.—Iodide of lead has long been supposed to have the resolvent properties of iodine, and when prescribed it is usually with this object in view. In SCROFULOUS ENLARGEMENT OF THE GLANDS Cotterau and De Lisle consider it the most efficacious of all the iodine salts, as it does not produce the cutaneous irritation so noticeable in other iodine preparations. We have employed it extensively in the form of the officinal ointment to be rubbed in twice daily in the treatment of non-suppurative ADENITIS.

J. Ashhurst accomplishes the same object by painting the surface with tincture of iodine, and then applying soap plaster spread on chamois skin; the free iodine unites with the lead in the soap plaster to form the iodide of lead. Tumefied lymphatic glands of the groin are often quickly reduced by applying the official ointment, and placing over the region a weight of a couple of pounds in the form of a bag filled with sand or shot.

PLUMBI NITRAS. Nitrate of Lead.

Nitrate of lead occurs in "colorless, transparent or white, nearly opaque, octahedral crystals, permanent in the air, odorless, having a sweetish, astringent, after-metallic taste and an acid reaction, soluble in two parts of water at 15° C. (59° F.), and in eight-tenths part of boiling water, almost insoluble in alcohol." (U. S. P.)

Nitrate of lead is an astringent and disinfectant. Lidoyen's disinfectant fluid consists of one drachm of nitrate of lead added to one ounce of water. This solution is prepared extemporaneously by dissolving a scruple of carbonate of lead in sufficient nitric acid for solution and adding a pint of water.

Nitrate of lead acts as a disinfectant by decomposing the sulphuretted hydrogen and by being in turn converted into sulphuret of lead. Thus it destroys odors arising from the gas just named, but does not arrest putrefaction. Solutions attack actively the solder of lead pipes; for this reason it should not be left in traps.

General Surgery.—Nitrate of lead is held in high esteem in the treatment of ONYCHIA. As advised by Moerloose and Vanzetti, the nail is to be trimmed to the level of the ulcer, and the powdered nitrate of lead dusted over the surface. The agent forms a thick crust, which separates in a few days, leaving a healed or rapidly-healing surface. It is of great service, also, in the treatment of the ulcer, after evulsion of the nail, in INFLAMMATION OF THE MATRIX, an affection common among poor and ill-conditioned emigrants. After the removal of the nail, which is usually loose, the ulcer is sprinkled with the powdered nitrate of lead, and over this is placed zinc ointment, spread on lint. Satisfactory results are obtained in the treatment of ERYSIPELAS by nitrate of lead, in the form of a solution, in the strength of from ten to twenty grains to the ounce of water.

Diseases of the Skin.—Nitrate of lead is occasionally applied to EXCORIATED SURFACES, and a solution made in the proportion of ten grains to an ounce of water and colored, probably with alkanet root, has been used on the Continent of Europe as a secret remedy in SORE NIPPLES, CHAPPED HANDS, CRACKED LIPS, etc. (U. S. D., 15th ed.). Ward employs a lotion twice or thrice daily in sloughing and indolent ulcers. (*Prov. Med. and Surg. Jour.*, October 15, 1851.)

A solution of nitrate of lead in glycerin, ten grains to the fluidounce, is useful in EXCORIATED NIPPLES.

Diseases of the Throat.—The nitrate of lead has a secondary position as a local astringent. It is sometimes used in the treatment of CHRONIC LARYNGITIS. A pigment may be prepared in the strength of five grains to the ounce.

PLUMBI OXIDUM. Oxide of Lead. Litharge.

"A heavy, yellowish, or reddish-yellow powder or minute scales, permanent in the air, odorless, tasteless, and insoluble in water or alcohol. When heated in contact with charcoal, it is reduced to metallic lead." (U. S. P.)

Emplastrum fuscum, or "universal plaster," consists of two parts each of finely-powdered red oxide of lead and of olive oil; after boiling, one part of yellow wax and one per cent. of camphor are added for some purposes. It is put up in cakes and boxes and sold as a secret preparation under different names.

EMPLASTRUM PLUMBI. Lead Plaster. Diachylon Plaster.

Lead plaster is made by boiling together oxide of lead, olive oil, and water in suitable proportions until a plaster is formed. "Lead plaster is white, pliable, and tenacious; free from greasiness or stickiness. It should be entirely soluble in warm oil of turpentine (absence of uncombined oxide of lead)." (U. S. P.)

General Surgery.—Oxide of lead is not employed alone, though in combination with oils and fats, which it saponifies, it forms the basis of many plasters. Bockart (*Med. News*, March 7, 1891) advises the following for the treatment of VENEREAL VEGETATIONS: Oxide of lead, four grains; saturated solution of potassa (at 100° F.), two drachms. The mixture to be applied by means of a glass rod or a splinter of wood, and then covered with a small compress. Contact with the growths for five minutes softens the mass and permits its easy removal. The skin should then be protected with iodoform or one of its substitutes.

Strapping the skin with broad pieces of lead plaster is an excellent remedy for BED SORES. Large sores frequently heal under this mode of treatment.

Diseases of the Skin.—The impure oxide of lead or litharge is ordinarily employed in dermatological practice, although there is no reason why, for most purposes, it cannot be replaced by the precipitated oxide.

It is one of the ingredients entering into the composition of "*Hebra's diachylon ointment*," where it occurs as an oleate or oleo-stearate of lead. This ointment is one of the most soothing and agreeable applications employed in dermatology. It is prepared as follows: ℞. Olei olivæ optimæ, f℥xv; lithargyri, ʒvi–℥iij; aquæ, q. s.

The oil is to be mixed with a pint of water, and heated by means of a steam bath to boiling, the finely-powdered litharge being sifted in and stirred continually; the boiling is to be kept up until the minute particles of litharge have entirely disappeared. During this process a few ounces more of water are to be added from time to time, so that when completed water still remains in the vessel. The mixture is to be stirred until cool. It should be of a putty-white color and of the consistence of butter. The best olive oil and the finest litharge only should be employed. (Duhring.)

This ointment becomes rapidly rancid, and must be kept in a cool place until wanted.

The *Unguentum diachylon*, as usually dispensed, is an inferior preparation, and often unfit for use.

Employed as a dressing, after the use of sapo viridis, unguentum diachylon forms one of the best applications in the treatment of some forms of ACUTE and SUBACUTE ECZEMA, particularly that form known as ECZEMA RUBRUM.

Recently a preparation called *caustic lead* has been recommended as a superior application to CONDYLOMATA. It is composed of one part of litharge and thirty parts, by weight, of a thirty-three per cent. solution of caustic potassa. The mixture should be well shaken before using.

In applying this caustic the warts should be cleansed with some antiseptic solution and dried. The caustic solution is then applied on a cotton swab, care being taken not to allow it to spread to the surrounding healthy parts. The condylomata are destroyed completely, and the charred masses can be wiped off the skin in a few minutes with dry cotton. The raw surfaces remaining are to be dressed with iodoform.

The process, though quick, must be painful, and perhaps the parts should be previously brushed over with a strong solution of cocaine.

Though called "caustic lead," the virtues of this preparation are probably those of a solution of caustic potash.

POTASSA. Potassium Hydrate. Caustic Potash.

Potassium hydrate is prepared by decomposing potassium carbonate with milk of lime (calcium hydrate). The solution is evaporated and the fused residue cast into sticks, in which form it is found in the shops, often under the name of "stick potash." It is officially described as "a white, hard, and dry solid, generally in the form of pencils, very deliquescent, odorless, or having a faint odor of lye, of a very acrid and caustic taste and a strongly alkaline reaction. Soluble in 0.5 part of water and in two parts of alcohol at 15° C.; very soluble in boiling water and in boiling alcohol." (U. S. P.)

The official preparations are Liquor Potassæ and Potassa cum Calce.

Caustic potassa is a powerful, painful, and diffusive escharotic, quickly destroying the life of the part with which it comes in contact. It appears to act by abstraction of the water from the tissues as well as by saponification of the fats, though it destroys all tissues other than bone and teeth indiscriminately. The first effect of the caustic is to turn the parts a dirty ashen to a black color. The eschar formed is soft if not gelatinous, and usually separates in from six to ten days.

Caustic potassa generally occurs in the form of clumsy crayons, which can be cut down or sharpened before they are used. By holding a stick under running water it is also rapidly reduced to convenient size. In operating, the stick of caustic potassa is wrapped up in a piece of cloth or paraffin paper, or is fastened in an instrument made for the purpose, only the point being left exposed. This is then touched, lightly at first, to the surface to be operated upon, the debris being wiped away with absorbent cotton. As the caustic is pushed deeper, a boring motion can be employed.

Another convenient means of dealing with the crayons is to pick them out of the bottle in which they are kept with a pair of dressing forceps, and while in the grasp of the instrument, to encircle one end with a few turns of adhesive plaster, thus giving a firm and safe hold for further handling.

General Surgery.—Caustic potash, if applied to the unbroken skin, soon melts, causing intense pain until the power of the caustic is destroyed. Owing to the dangers attending its diffusion and the difficulties of manipulation, this agent, as a rule, is not often employed, except where a very active and destructive action is desired. When a large surface is to be covered the Paquelin cautery is to be preferred. In vicious INCURVATION OF THE NAIL caustic potassa is one of the best agents for the destruction of the matrix. If not destroyed the new nail will be deformed. A small crayon is quickly insinuated around the matrix, the cavity is then packed and the parts covered with lint saturated with carbolized oil. In FISTULA IN ANO it is often a good plan, after the laying open of the sinus, to wipe the entire tract with the caustic, thus making a superficial slough and preventing the premature closure of the cut edges. In MALIGNANT PUSTULE cauterization with this agent is recommended. In CHANCROIDAL BUBO, which has gone on to suppuration, and when the timidity of the patient will not permit the use of the knife, the contents may be evacuated by placing a piece of adhesive plaster, in which a small hole has been cut in the centre, over the place at which the bubo is pointing. In this opening a small piece of caustic potassa, the size of a pea, is lodged, and retained by another piece of plaster. In a short time the caustic will have eaten its way through the abscess wall. In RABIES, D. H. Agnew ("Surgery," vol. 1, p. 225) advised the thorough cleansing of the wound with a solution of carbolic acid (1–10), and then cauterization with caustic potassa. Bollinger, after estimating the value of cauterization, concludes that only thirty-three per cent. of persons thus treated fall victims to the disease, while eighty-three per cent. of those in whom it is not practiced die.

Diseases of the Skin.—Caustic potash is the most efficient caustic employed in dermatology. It should always be kept in mind that the action is diffusive, and the operator should stop short of the point to which he wishes the cauterization to extend. A small vessel containing vinegar or dilute acetic acid should be at hand, the thorough application of which will arrest the action of the caustic at once. After a little experience the operator can estimate with accuracy how much beyond the point of actual contact the action of the caustic will extend.

In operating upon small EPITHELIOMATA, or other growths, the surrounding skin should be protected by adhesive plaster or oil, as the deliquescent fluids carry the potash for some distance over the surface with the result of causing superficial inflammation and annoyance.

The slough and other debris should be removed so far as possible after an operation with caustic potash, and the resulting wound treated antiseptically.

Caustic potash must never be employed upon the mucous membranes, or only with the utmost care, since its action spreads rapidly and indefinitely over moist surfaces. In operating near the orifices of the body great precaution must be observed to prevent the liquefied caustic potash producing irremediable destruction.

Diseases of the Ear, Nose, and Throat.—Caustic potash has been employed to destroy AURAL POLYPI, but such use of this powerful agent cannot be free from danger. Fortunately, we have many other means by which we can successfully destroy these outgrowths. If, in the judgment of the physician, it is necessary to apply caustic potash, it is well to remember Clark's injunction, that a layer of cotton moistened with acetic acid lay along the walls of the meatus; the object of this is to neutralize the excess of alkali. Caustic potash has also been used by Michel, of Cologne, in treating spots of degeneration in OZÆNA. He also employs it in SYPHILITIC ULCERATIONS OF THE PHARYNX. He does not mention details, but it would appear to be a difficult agent to manage, either in the nose or the pharynx.

LIQUOR POTASSÆ. Solution of Potassa. Solution of Caustic Potash.

"An aqueous solution of hydrate of potassium, containing about five per cent. of the hydrate. A clear, colorless liquid, odorless, but having a very acrid and caustic taste and a strongly alkaline reaction. Specific gravity about 1.036." (U. S. P.)

General Surgery.—In INGROWING TOE-NAIL Norton has found advantage in the application of dilute liquor potassæ (two drachms in one ounce of water). A pledget of absorbent cotton is saturated with the solution and gently pressed between the upper surface of the nail and the soft tissues. The superficial cells are softened, and can easily be wiped away, and in a short time the nail can be scraped without causing pain.

Diseases of the Skin.—Solution of caustic potassa of various strengths is employed in the treatment of skin diseases, chiefly for the purpose of softening and dissolving the horny epithelium, or as a preparation for the action of other remedies.

In ECZEMA of the external meatus a solution of ten grains to the ounce is lightly brushed over the surface and washed off as a preliminary to the employment of an ointment. A similar application is sometimes made to the edges of the eyelids when eczematous.

In CHRONIC ECZEMA, especially when occurring in circumscribed patches, a solution of ten to sixty grains of caustic potassa to the ounce of water, well-rubbed in and then washed quickly off, to be followed by a soothing ointment, often hastens the cure.

Bulkley's "*Liquor Picis Alkalinus*" (see *Pix*), composed of two drachms caustic potassa, one drachm tar, and five drachms water, is an admirable preparation. It should be diluted with five to twenty parts of water before using.

Diseases of the Ear and Throat.—In the proportion of one part to ten of water, liquor potassa is useful in softening IMPACTED CERUMEN. For all purposes, when an alkaline solution is needed about the ear, Von Trœltsch employs four to forty drops of liquor potassæ to an ounce of water. In one part to four of water, it is recommended by M. Mackenzie for DIPHTHERIA.

POTASSA CUM CALCE. Potash with Lime. Vienna Caustic. Vienna Paste.

It is made by rubbing together equal parts of potassa and lime. Vienna paste is more easily manipulated, but is weaker than caustic potassa.

General Surgery.—Vienna caustic is usually made into a paste with alcohol, spread on plaster, and placed over the selected part. M. Piedagnel states that the action may be rendered nearly painless by the addition of one part of morphine to three parts of the powder; he adds chloroform to form a paste. In a short time the skin becomes a dull white color, and at the end of fifteen minutes it is carbonized. If the paste is retained, the slough formed will be about as thick as the layer of caustic employed. Vienna paste is often resorted to for the destruction of CARCINOMA. A clean surface is formed, which heals rapidly. Nevertheless, caustics are to be recommended only in cases of extension of superficial ulceration, or in instances where, for special reasons, excision is contraindicated. Vienna paste has been a favorite caustic for the treatment of VARIX with many surgeons. The method of applying the agent is to take several narrow pieces of adhesive plaster, in which a number of small holes are cut. These are applied, at short distances apart, over the course of the veins; the holes are filled with the paste and covered with a second piece of plaster, which must be entire. Filhos has introduced the paste, moulded into crayons, thus rendering them more manageable, as they can be coated with melted gutta-percha. Vienna paste is to be preferred for cauterizing the neck of the uterus.

Diseases of the Skin.—This preparation is rarely employed in America as a dermatological application. It is, however, sometimes used to destroy Epitheliomata and other Morbid Growths.

Diseases of the Ear.—Toynbee recommends Vienna paste for the destruction of Aural Polypi. It appears to be, in this connection, a more painful application than the *Soda cum calce*.

POTASSA SULPHURATA. Sulphurated Potassa. Sulphide of Potassium. Potassii Sulphuretum. (U. S. P., 1870.) Sulphuret of Potassium. Liver of Sulphur.

Sulphurated potassa has "a faint, disagreeable odor, a bitter, alkaline, repulsive taste, and an alkaline reaction; it is soluble in about two parts of water at 15° C. (59° F.), with the exception of a small residue; it is soluble in alcohol, the latter leaving undissolved the accompanying impurities." (U. S. P.) "The aqueous solution is an orange-yellow color, and exhales the odor of hydrosulphuric acid." (U. S. D.)

Sulphuret of potassium is parasiticide, and is an antidote to the salts of lead.

General Surgery.—This salt is employed with benefit in the treatment of Chronic Lead Poisoning. A bath at the temperature of 100°, in which the drug is dissolved (in the proportion of from fifteen to thirty grains to the gallon of water) is recommended. If possible, the bath must be administered in a porcelain-lined tub. The patient is immersed half an hour. The bath may be repeated every second or third day. After immersion, the body is thoroughly washed with warm soapsuds.

Diseases of the Skin.—Sulphurated potassa is chiefly employed in the form of a lotion (fifteen to thirty grains to the fluid ounce), bath (two to four ounces to thirty gallons), and ointment (half a drachm to the ounce of lard). It has been employed in the treatment of Scabies and the other Animal and Vegetable Parasitic Skin Diseases.

POTASSII BROMIDUM. Bromide of Potassium.

Bromide of potassium is "odorless, having a pungent, saline taste, and a neutral reaction." (U. S. P.)

Bromide of potassium is sedative, detergent, and antispasmodic.

General Surgery.—J. W. Blight (*Practitioner*, February, 1874) speaks highly of an injection of bromide of potassium in the treatment of Gonorrhœa: ℞. Potass. bromid., ʒij; glycerini, f℥ss: aquæ, f℥vj; a syringeful every four hours. In painful Hemorrhoids Ferrand found immediate relief afforded by compresses saturated with bromide of potassium four parts, glycerin twenty parts. In fine powder it has been dusted over Indolent Ulcers with asserted benefit.

Diseases of the Throat.—Bromide of potassium is an admirable sedative to the throat; it prepares the pharynx for examination and relieves the sense of weariness arising from excessive COUGHING; a strength of from ten to twenty grains to the ounce of water suffices. The solution may be also employed directly upon the vocal cords. Bromide of potassium is associated with chlorate of potassium as a gargle or inhalant in PHARYNGITIS. J. McNeal, of Gettysburg, Pa. (*Phila. Med. Times*, May 21, 1881), recommends the following as an inhalant in DIPHTHERIA: To one pint of water add one drachm of potassium bromide, two drachms of potassium chlorate, and twenty grains of carbolic acid.

POTASSII BICHROMAS. Bichromate of Potassium.

This compound of chromic acid and potassium occurs in "large, orange-red, transparent, four-sided, tabular prisms, permanent in the air, odorless, having a bitter, disagreeable, metallic taste, and an acid reaction. Soluble in ten parts of water at 15° C. (59° F.), and in 1.5 parts of boiling water; insoluble in alcohol." (U. S P.)

Diseases of the Throat, etc.—A gargle of one-eighth of a grain of the salt to an ounce of water is sometimes effective in the SUBACUTE PHARYNGITIS of puberty.

POTASSII CARBONAS. Carbonate of Potassium.

This salt was formerly exclusively prepared by lixiviating wood ashes. At present, in addition to the above source, a considerable quantity is made from the sulphate and chloride of potassium found at Stassfurt, Germany.

Potassium carbonate occurs as "a white, crystalline or granular powder, very deliquescent, odorless, having a strongly alkaline taste and an alkaline reaction. Soluble in one part of water at 15° C. (59° F.), and in 0.7 part of boiling water; insoluble in alcohol. The aqueous solution strongly effervesces on the addition of acid." (U. S. P.)

Carbonate of potash is antipruritic and antacid.

Diseases of the Skin.—Carbonate of potassium is employed as an alkaline lotion, two or three drachms to the pint of water, or as an ointment, ten grains to a drachm in an ounce of lard.

In baths, ten to sixteen ounces may be dissolved in thirty gallons of water. The carbonate of potassium preparations are used in ECZEMA, DERMATITIS, PSORIASIS, URTICARIA, and other pruriginous diseases.

POTASSII CHLORAS. Chlorate of Potassium. Chlorate of Potash.

Chlorate of potassium exhibits "colorless, monoclinic prisms or plates of a pearly lustre, permanent in the air, odorless, having a cooling, saline taste and a neutral reaction; soluble only in sixteen and five-tenths part of water at 15° C. (59° F.) (thirty grains to the ounce of water) and in two parts of boiling water; only slightly soluble in alcohol." (U. S. P.) The only official preparation is the trochisci potassii chloratis,

each of which contains five grains. Chlorate of potassium should not be mixed in the dry state with organic substances, sulphur, or ammonium chloride, as explosions frequently result.

Chlorate of potash is detergent. It is said by M. Mackenzie to be antiseptic and by Lefferts to be astringent and stimulant. When applied in crystals or saturated solution to mucous membranes and ulcerated surfaces, it is irritant.

Chlorate of potash mollifies the unpleasant impression excited by some drugs, such as creolin, creasote, resorcin, etc. It also lessens the effect of astringency on gustatory surfaces. Hence it is often employed as an adjuvant.

General Surgery.—Various attempts have been made to use solution of chlorate of potash in the treatment of FOUL and INDOLENT ULCERS, but with slight success. In phagedenic conditions the drug is often dusted on the affected parts twice daily. Relief is afforded in cases of HEMORRHOIDS by gently injecting into the rectum half an ounce of a saturated solution, to which fifteen drops of laudanum are added.

Diseases of the Skin.—A solution has been employed as a local application in MOIST ECZEMA and FOUL ULCERS.

A saturated solution of chlorate of potassium in water (thirty grains to the ounce) has sometimes been employed successfully in the treatment of EPITHELIOMA, and the powdered salt has also been used, but this remedy has not found general favor.

Diseases of the Nose and Throat.—Chlorate of potash is often substituted for borax in *Dobell's solution*. As a pure lotion it may be ordered in the proportion of twenty grains to the ounce of water in ACUTE CORYZA. Michel, of Cologne, employs it in OZÆNA. It has an important position in the local treatment of DIPHTHERIA, and is usually stated, but upon insufficient grounds, to be a solvent of the membrane. Chlorate of potash is extensively employed in various AFFECTIONS OF THE MOUTH, and is of special value in simple and mercurial salivation and in APHTHOUS ULCERATION. It is especially useful in morbid states of the gum dependent on carious teeth. It may be employed freely in a saturated solution, to which a little tincture of myrrh is added. The same strength solution is used in the pharynx and larynx as in the nose. The mixture is placed in a six-ounce vial, which, while the nascent chlorine is being generated, is filled with water. An ounce of the mixture is to be used as a gargle every three hours. J. Merces (*Lancet*, October 30, 1886) recommends that a drachm of chlorate of potash be mixed with a half drachm of hydrochloric acid for the treatment of DIPHTHERIA. Chlorate of potassium is employed in affections of the oral cavity, in the form of five-grain tablets, of which several daily may be allowed, one after another, to slowly dissolve in the mouth.

As a preventive of MUCOUS PATCHES, the remedy may be employed in this way in the earlier months of SYPHILIS and to prevent MERCURIAL STOMATITIS. A solution of twenty grains to the ounce of water may be used as a gargle with the same object in view. In STOMATITIS, mercurial or otherwise, in HERPES OF THE BUCCAL CAVITY, and in SYPHILITIC MUCOUS PATCHES chlorate of potash forms an excellent application. Two drachms of the drug to eight ounces of water makes it efficient in ACUTE ANGINA. It may be combined with tannic acid * (see p. 62) or alum. Chlorate of potash is in good repute in the treatment of PHARYNGITIS. However, it cannot be employed for a long period, owing to the circumstance that the influence on the system is depressing. In the treatment of CHRONIC PHARYNGITIS, therefore, it has been generally abandoned. (Thos. F. Rumboldt, *St. Louis Archives*, December, 1873.) In CHRONIC LARYNGITIS a spray of five to twenty grains to the ounce of water is useful. It is a favorite ingredient of a lozenge in excited states of the throat. From two to five grains are contained in each mass.

POTASSII CITRAS. Citrate of Potassium. Citrate of Potash.

"A white, granular powder, deliquescent on exposure to air, odorless, having a slightly cooling, alkaline taste and a neutral or faintly alkaline reaction. Soluble in 0.6 part of water at 15° C. (59° F.) and very soluble in boiling water; very slightly soluble in alcohol." (U. S. P.)

Diseases of the Mouth.—Citrate of potash is detergent and sialogogue; it is often prescribed in the form of a lozenge, three grains in each mass.

POTASSII CYANIDUM. Cyanide of Potassium. Cyanide of Potash.

"White, opaque amorphous pieces, or a white, granular powder, deliquescent in damp air, odorless when perfectly dry, but generally of a peculiar, characteristic odor, having a sharp, somewhat alkaline and bitter almond taste and a strongly alkaline reaction. The commercial salt is soluble in two parts of water at 15° C. (59° F.) and in one part of boiling water. It is but sparingly soluble in alcohol." (U. S. P.)

Cyanide of potassium is sedative and antipruritic. It removes stains of nitrate of silver from the skin. Owing to its highly poisonous character, it must be used with caution.

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* In associating chlorate of potassium with tannic acid care must be observed that it is done only in solution. If the dry powders are mixed, explosions will occur on the slightest provocation.

Diseases of the Skin.—The virtues of CYANIDE OF POTASSIUM are dependent upon the hydrocyanic acid it contains. (See *Acidum Hydrocyanicum.*) The salt is employed as a lotion, dissolved in water, in the strength of two grains to the ounce in PRURITUS VULVÆ. An ointment of cyanide of potassium, six grains, with one grain of cochineal as a tincture to an ounce of cold cream, is sometimes applied for the relief of PRURITUS and URTICARIA. This preparation should be kept in the dark and used cautiously upon broken skin.

POTASSII IODIDUM. Iodide of Potassium. Iodide of Potash.

The crystals of iodide of potassium are "colorless, translucent, cubical, slightly deliquescent, having a peculiar, faint odor, a pungent, saline, and afterward somewhat bitter taste, and a neutral reaction. Soluble in 0.8 part of water and in eighteen parts of alcohol, at 15° C. (59° F.); in 0.5 part of boiling water and in six parts of boiling alcohol." (U. S. P.) The ointment (*Unguentum Potassii Iodidi*), containing twelve parts of iodide of potassium in one hundred parts of ointment, is official.

Iodide of potassium is absorbent and alterative.

General Surgery.—Iodide of potassium is employed but little as a local application in surgery. We have obtained satisfactory results at the Episcopal Hospital from an ointment composed of three parts of iodide of potassium to the ounce of lanolin, as a substitute for iodide ointment in the treatment of INGUINAL ADENITIS, combined with pressure of three to four pounds from a bag of shot placed over the groin, which had been previously covered with the ointment spread on lint—the whole retained by a spica bandage. The time required to accomplish resolution has been shorter than that required by other modes of treatment. In the stiffening following injuries about the articulations, so common in rheumatic persons, the ointment has been found useful when rubbed thoroughly into the affected part twice daily. Its action may be enhanced by soaking the limb in hot soapsuds for half an hour, and on its removal from the bath rubbing it with the ointment.

Diseases of the Ear and Throat.—The local applications of iodide of potassium in the respiratory tract are few in number. A solution of two to ten grains to the ounce has been used for injection through a catheter in thickening of the lining membrane of the Eustachian tube.

V. Gautier (*Soc. Méd. de Genève* also *Rev. Méd. de la Suisse, Rom.*, March 20, 1888) reports two cases in which local applications of iodide of potassium to a cyst of the thyroid region induced chronic iodism. A spray of five grains to the ounce of water has been employed in CHRONIC LARYNGITIS with diminished secretion.

POTASSII NITRAS. Nitrate of Potassium. Saltpetre.

Nitrate of potassium is "colorless, transparent, six-sided, rhombic prisms, or a crystalline powder, permanent in the air, odorless, having a cooling, saline, and pungent taste, and a neutral reaction. Soluble in four parts of water at 15° C. (59° F.) and in 0.4 part of boiling water; almost insoluble in alcohol." (U. S. P.)

The "*Charta Potassii Nitratis*" (nitrate of potassium paper) is official. It is prepared from white, unsized paper dipped in a solution of twenty parts of nitrate of potassium, and eighty parts of water and dried.

Diseases of the Throat, etc.—Nitrate of potassium in the proportion of one drachm to the pint of water is a useful ingredient in a gargle in the late stage of PHARYNGITIS. This agent enjoys a high reputation for relaxing the paroxysms of ASTHMA, especially where they are dependent upon excited conditions of the nasal mucous membrane. It is ordinarily employed by inhaling the fumes from burning paper which has been previously saturated in a strong solution of the salt. Nitrate of potassium is often administered in the presence of the fumes of stramonium. S. Ringer and W. Murrell (*British Medical Journal,* June 6 and June 23, 1888) recommend ordinary blotting paper for this purpose; it should consist of six thick layers which have been dried after being steeped in a saturated solution of nitrate of potassium and chlorate of potassium. The paper may be sprinkled with compound tincture of benzoin, tincture of sumbul or essence of camphor, oil of cassia, or oil of cinnamon. According to M. Mackenzie, nitrate of potassium is conveniently exhibited in solution. The No. 1 solution of this writer is composed of thirty grains to the ounce of water, the No. 2 is forty-five grains to the ounce, and the No. 3 is sixty grains to the ounce.

POTASSII PERMANGANAS. Permanganate of Potassium.

"Deep, purple-violet, or nearly black, needle-shaped, rhombic prisms, of a metallic lustre, permanent in the air, odorless, having a sweet, afterward disagreeable, astringent taste, and a neutral reaction. Soluble, with the exception of a scanty, brown residue, in twenty parts of water, at 15° C. (59° F.) and in three parts of boiling water. It is decomposed by alcohol." (U. S. P.)

For convenience in hospital practice a saturated solution (twenty-four grains to the ounce) is kept on hand. A solution of permanganate of potassium constitutes *Condy's Fluid.*

Permanganate of potassium is antiseptic, deodorant, and detergent.

Permanganate of potassium in substance, or strong solution, acts as a stimulant or mild escharotic; but when well diluted it causes neither pain nor irritation. It readily parts with its oxygen, hence it is valuable as a deodorant. According to Demarquay, it possesses little or no power in arresting the putrefactive process, but when thrown in contact with decomposing substances it has the power of seizing upon the products and combining with them or oxidizing them. According to Sternberg, it is evident that the permanganate of potassium has antiseptic and germicidal properties; in this connection, however, it is seldom used.

General Surgery.—Solutions of the permanganate of potassium have long been regarded as one of the best detergent and deodorizing washes in all foul, gangrenous, and ill-conditioned ulcerations. For general purposes a half drachm to a drachm of a saturated solution may be added to a quart of tepid water. The solution should be distinctly purple, yet permit a silver coin to be seen at a depth of two inches. In special cases stronger solutions, namely, ten grains to the ounce of water, may be employed. The introduction of corrosive sublimate has led to the less frequent employment of permanganate of potassium. Yet, owing to its non-toxic properties, it will always hold a distinctive place in local therapeutics. It is a most valuable agent in solution to correct the fetor in the buccal cavity following fracture of the jaw, and after amputations of the tongue. The foul discharges of cancer, especially of the uterus and vagina, are corrected by the permanganate of potassium. Hot solutions, of the strength of two drachms to the pint of water, will be found of service. S. Weir Mitchell recommends the permanganate of potassium as an antidote to the venom of serpents.

Diseases of the Skin.—Permanganate of potassium is used in solutions of fifteen to sixty grains to the pint of water as a dressing for FOUL ULCERS and in a weak solution as an application in BROMIDROSIS.

Diseases of the Ear, Nose, etc.—Permanganate of potassium is prescribed, ordinarily, in a strength varying from one to five grains to the ounce of water. One grain to the ounce is used as a disinfectant in DISCHARGES FROM THE MIDDLE EAR; four grains to the ounce in NASO-PHARYNGEAL CATARRH; five grains to the ounce for FŒTID CATARRH and FOUL BREATH. Three grains to the ounce is used as a gargle in CANCER OF THE TONGUE, DIPHTHERIA, and in PUTRID SORE THROAT, as well as a spray in CHRONIC LARYNGITIS, with excess of secretion. Hill and Cooper speak highly of this agent in SYPHILITIC ULCERS of the mouth and throat.

POTASSII TARTRAS. Tartrate of Potassium. Tartrate of Potash.

"Small, transparent, white, monoclinic crystals, or a white powder, somewhat deliquescent, odorless, having a saline, slightly bitter taste, and a neutral reaction. Soluble in 0.7 part of water at 15° C. (59° F.) and in 0.5 part of boiling water; almost insoluble in alcohol." (U. S. P.)

Diseases of the Throat, etc.—Tartrate of potash is a sialogogue. It is an agreeable ingredient to a lozenge—each mass containing three grains.

PULSATILLA.

"The herb of *Anemone Pulsatilla* and *A. pratensis*, Linn., and of *A. patens*, Linn., var. *Nuttalliana*, Gray." (U. S. P.)

Pulsatilla has long had a doubtful position as an internal remedy for perverted functions of the mucous membranes.

Diseases of the Nose, etc.—Potter mentions, without critical comment, its use in the form of a weak, warm infusion in ACUTE NASAL CATARRH, accompanied with muco-purulent discharge.

PUMEX. Pumice. Pumice Stone.

Pumice is a felspathic volcanic scoria.

When the hands are kept for a long time in contact with carbolized solutions, the epidermis becomes roughened and forms a nidus for the collection of foreign matter, which cannot be removed with an ordinary nail-brush. In this condition pumice will be found valuable for thorough cleansing, so necessary before all antiseptic procedures.

Diseases of the Skin.—Pumice powder enters into the composition of soaps, which are employed in the treatment of sluggish ACNE and COMEDO.

PYOKTANIN. Pyoctanin. Methyl-violet.*

Pyoktanin is a derivative of a diphenylamine compound. It is one of the aniline colors.

Pyoktanin ordinarily comes in the form of a powder, though crayons of various shapes and sizes are procurable. A broad, cone-shaped crayon protected by a wooden-box covering, as well as a narrow, pencil-like form, may be mentioned in this connection. "Pyoktanin crayons may be mended by simply wetting the severed surfaces with water and pressing them together gently; when dry they will cohere." (M. B., January, 1891, p. 14.) Solutions should not be more than four days' old, and should be kept in colored glass bottles.

Pyoktanin is antiseptic and moderately analgesic. It possesses the advantage over many germicides of not coagulating albumin; on the other hand, it stains the skin. For removal of the discoloration one may use spiritus saponatus or a ten per cent. solution of castile soap in alcohol (or even common soap—washing the parts afterward with alcohol), or Labarraque's solution (M. B. [*l. c.*]). Riesmeyer (*St. Louis Courier of Medicine*, November, 1890) claims that pyoktanin exerts a favorable influence over wounds healing by granulation; especially is the tendency to exuberant pullulations held in check, while no necrotic effect is exhibited on the nascent epithelial cells.

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* "Yellow pyoktanin" is a substance belonging to the group of aniline dyes, known as *auramines*. Its properties are reported to be similar to those of *methyl-violet*, but it is less frequently used in practice than the agent last named.

General Surgery.—Pyoktanin was introduced by Stilling, who believed the drug to be capable of penetrating tissue and acting upon deeply-seated micro-organisms. That the dye is absorbed by the micro-organisms has been demonstrated. Fessler found that the germs were destroyed in fifteen minutes by exposure to a solution of 1–1000. It has been claimed that it sterilizes the pus of suppurating wounds and abscesses. However, it is not so active a germicide as is corrosive sublimate or carbolic acid. Being practically non-poisonous, pyoktanin offers a valuable means for the cleansing of large suppurating cavities, such as those of EMPYEMA, where the employment of more potent agents is liable to be followed by toxic symptoms. For this purpose it may be employed in strength of 1–1000 or 1–2000. If used for the disinfection of instruments a much weaker solution may be used. When employed for the irrigation of wounds it should be applied until the tissues are of a deep color. Good results are said to have followed the injection of a weak solution in GONORRHŒA. Mosetig-Moorhof (*Wien med. Presse*, 1891, No. 6) reports encouraging results from the use of pyoktanin in dissipating SARCOMA and CARCINOMA. Nance commends the drug for parenchymatous injections of a one per cent. solution.

Diseases of the Skin.—Von Sehlen has succeeded in curing a severe case of EPITHELIOMA by means of pyoktanin applied in substance. The application was at first quite painful, so that applications of cocaine and antipyrine had to be employed.

Galezowski has used pyoktanin in a one per cent. solution in water in the treatment of EPITHELIOMA OF THE EYELID.

Pyoktanin completely arrests the development of the *Staphylococcus areus*, and is therefore likely to be a good topical application in FURUNCLE, COCCOGENIC SYCOSIS, and other parasitic skin diseases.

Pyoktanin has come into general use in veterinary medicine in the treatment of foot and mouth disease.

Diseases of the Ear, Nose, and Throat.—The properties of pyoktanin make it available in the treatment of suppurative conditions of the middle ear. The many admirable agents already accredited have caused pyoktanin to be used less than its merits warrant. The highly diffusible character of its solutions might render their presence in the outer ear passage objectionable. R. Barclay (*St. Louis Courier of Medicine*, 1890, III, 216) uses pyoktanin (1–1000), for ten minutes or more, by instillation in the external meatus for the suppurative stage of OTITIS MEDIA. The author reports eight cases. In an average of eleven days' treatment marked amelioration or cure resulted in all. Bresgen (*Deutsche* *med. Wochensch.*, 1890, No. 24) claims value for pyoktanin in overcoming hyperæsthesia of the nasal mucous membrane. The writer also recommends that solutions be used after galvano-cautery applications.

Pyoktanin is of special value in the treatment of EMPYEMA OF THE FRONTAL SINUS and of the ANTERIOR ETHMOID CELLS. A ten per cent. solution can be thrown into the sinus, or, as recommended by Cholewa (*Therap. Monatshefte*, 1891, p. 189), it is carried in substance by a delicate silver probe, armed with the pyoktanin, directly into the sinus. Favorable results are reported. A strength of solution similar to the above is used by R. P. Lincoln (*N. Y. Med. Jour.*, October 31, 1891) in NASAL DIPHTHERIA with success after all other remedies had failed. Forty-eight hours after the first application all trace of the membrane had disappeared. The same writer found satisfactory results follow its use in OZÆNA, both in syphilitic and non-syphilitic forms.

In the pharynx the indications for its exhibition are found in ULCERATION, PURULENT DISCHARGES, DIPHTHERIA, and APHTHÆ. A fifty per cent. solution may be applied to the recesses of the tonsil; it destroys the micro-organisms there lodged and relieves the irritability of the parts. Jænicke uses a saturated solution of pyoktanin in DIPHTHERIA. The preparation is gently rubbed upon the infected surfaces once every two or three hours. It possesses an advantage over other antiseptics in clinging to the exudate for a long time. Capart (*Jour. of Laryngology and Rhi nologia*, August, 1891, p. 343) claims that TUBERCULAR ULCERATION OF THE SOFT PALATE was healed by local application of pyoktanin. J. Schleinmann (*Berl. klin. Wochenschr.*, August 18, 1890, No. 33) and Bresgen (*Deutsche med. Wochenschr.*, No. 4, 1890) heat probes dipped in the powder and rub them on the ulcers of LARYNGEAL PHTHISIS; it promotes cicatrization.

Diseases of the Eye.—Stilling (*Revue General d'Ophthalmol.*, 1890, No. 4 and No. 6) makes strong claims for the aniline colors, as antiseptics, in ophthalmic surgery. He considers them superior to all other antiseptics, on the ground that they are unirritating and harmless, that they are more diffusible, and that they do not form precipitates with pus. He claims that they not only prevent suppuration, but check it when established by permeating the tissues in which it has taken place. He prefers the methyl-violet, and uses it in solution of one to one thousand, and in some cases much stronger. He claims astonishing results from its use, especially in SLOUGHING KERATITIS, and recommends it in PURULENT CONJUNCTIVITIS, CORNEAL ULCERS, PARENCHYMATOUS KERATITIS, SEROUS IRITIS, DISSEMINATE CHOROIDITIS, and SYMPATHETIC OPHTHALMIA. Most other observers have been much less enthusiastic. Some have maintained that it is a weak antiseptic and practically useless, and others that it is not so unirritating as he claims, and that it sometimes does harm. Extensive testing in Græfe's clinic (*Arch. Ophthal.*, January, 1891, page 143) gave unfavorable results. Wanscher (*Therapeutische Monatshefte*, February, 1891, *Phila. Med. News*, April 25, 1891) confirms Stilling's claims as to the pus-killing properties of pyoktanin, and considers it one of our most valuable remedies in PURULENT OPHTHALMIA, but is doubtful of its efficacy in IRITIS and CHOROIDITIS. He uses a one per cent. solution of methyl violet, and insists upon the importance of frequent applications, instilling it every two or three hours until the tissues are thoroughly stained. There is no permanent staining; the color disappears quickly.

The valuable property of diffusibility is generally conceded to pyoktanin, and, if experience should establish its antiseptic qualities, will make it a useful addition to our list of external remedies, particularly for application to regions difficult of access, such as the lachrymal passages.

PYRETHRUM. Pyrethrum. Pellitory.

"The root of *Anacyclus pyrethrum*." (U. S. P.) It contains an acrid resin, an acrid fixed oil, a proportion of tannin, gum, etc. The official preparation is the tincture, which contains the activity of twenty parts of pyrethrum in one hundred parts of the tincture.

Pyrethrum is sialagogue and stimulant.

Diseases of the Mouth, etc.—Pyrethrum is sometimes employed for the relief of TOOTHACHE, either by chewing a piece of the root, or by applying a small pledget of cotton saturated with the tincture into the cavity of a carious tooth. For RELAXATION OF THE UVULA pyrethrum has long had a reputation in domestic medicine. A small quantity of the root can be chewed. In CHRONIC LARYNGITIS, with diminished secretion, ten minims of the tincture can be added to an ounce of water and sprayed upon the vocal cords. Lozenges of pyrethrum contain one grain of the root in each mass.

PYRIDINE.

Pyridine is a liquid, with a peculiar, strong odor, and is obtained from many sources, among them bone oil, coal tar, and tobacco. It is used by inhalation, and being volatile, the air of a room, at a temperature of 68° to 77° F., may be quickly impregnated with its vapor by placing a small quantity of it on a hot plate.

Diseases of the Throat, etc.—Pyridine is employed by Sée as an inhalation to relieve the paroxysms of ASTHMA in children. (Quoted in *Med. and Surg. Reporter*, March 21, 1891.) One or two teaspoonfuls may be placed on a plate and the fumes inhaled, holding the face closely over it for twenty to thirty minutes.

QUERCUS ALBA. White Oak.

"The bark of *Quercus alba*." (U. S. P.) White oak bark is used in medicine for the large proportion of tannin which it contains. The bark of all the other oaks likewise contains much tannin, but *Q. alba* is the official species. (See *Acidum Tannicum.*)

Diseases of the Skin.—Infusion of white oak bark is used as an astringent in several diseases of the skin. In DERMATITIS VENENATA it forms a useful application. In PURPURA also the infusion is often used locally. Its action in this affection is not deep enough to be available. In flabby and ill-conditioned ULCERS the decoction of oak bark has been used with advantage.

QUILLAIA. Quillaia. Soap Bark.

"The bark of *Quillaia saponaria*." (U. S. P.) Soap bark contains a peculiar principle known as saponin, which, when shaken with water, has the quality of making the water milky and frothy, as does soap. Saponin is soluble in water, weak alcohol, but insoluble in volatile oils, and ether.

Diseases of the Skin.—The tincture of *Quillaia saponaria* is employed to cleanse the scalp in PITYRIASIS before the application of the more strictly medicinal agents. It is considered by some authorities superior to soap for this purpose.

Diseases of the Nose and Mouth.—Soap bark infusion may be added to mouth washes and gargles to impart to them a lather-like appearance. The active principle, saponin is employed in solution by Valentin (*Correspondenzblatt für schweizer Aerzte*, No. 5, 1887) in the treatment of CHRONIC NASAL CATARRH if the secretion is deficient. The powdered bark has been used as a snuff, but the practice cannot be recommended.

QUININA. Quinine.

Quinina is "an alkaloid prepared from different species of cinchona." (U. S. P.) The uncombined alkaloid is rarely used in medicine. The salts most commonly employed are the sulphate, which requires for its solution seven hundred and forty parts of water; the bisulphate, soluble in about ten parts of water; the hydrochloride, soluble in thirty-four parts of water, and the hydrobromide, soluble in about sixteen parts of water.

Quinina in weak solution is antiseptic, since it is one of the most active agents in arresting movements of protoplasms. It also destroys infusoria. It is, moreover, stimulant, and has some repute in covering the odor of iodoform.

General Surgery.—Ledetsch (*Jour. of Cutan. and Genito-Urin. Dis.*, 1888) has employed quinine solution as an injection in the treatment of GONORRHŒA of long standing. He advises the use of the following mixture: Quinine bisulph., 1 part; glycerin, 25 parts; distilled water, 74 parts.

Diseases of the Skin.—The only local use of quinine in dermatology is in the treatment of ALOPECIA. Quinine hair-washes are frequently advertised by apothecaries, with the idea, probably, of implying a local "tonic" effect upon the scalp. That there is, however, some virtue in such preparations would appear from the fact that they are recommended by several dermatologists of repute. The influence of quinine upon the scalp is, however, probably purely stimulant and not specific in any way. It is possible that in parasitic forms of alopecia quinine may act as a parasiticide, but this action has never been proved.

Bulkley recommends in ALOPECIA: ℞. Quininæ sulphatis, ℈j; zinci sulphatis, gr. x; tinct. cantharidis, fʒiij; alcoholis absolut., glycerini, āā fʒiv; spiritus myrciæ, ad f℥vj. M.

Another formula often employed is: ℞. Quininæ sulphat., ʒj; tinct. nucis vomicæ, fʒij; aq. rosæ, spiritus myrciæ, āā f℥j. M. An ointment of quinine (ʒj ad ℥j) has been employed in DERMATITIS VENENATA.

Diseases of the Throat, Nose, etc.—Quinine at one time, through the recommendation of Helmholtz, enjoyed a reputation as a local remedy in HAY FEVER. Sir Andrew Clark (*Lancet*, June, 1887) employed a mixture composed of glycerite of carbolic acid, one ounce; hydrochloride of quinine, one drachm, and one-thousandth part of bichloride of mercury. It has been used as a spray in the treatment of DIPHTHERIA. C. Seiler speaks well of it in the treatment of OZÆNA. WHOOPING COUGH is treated by Michel (*Deutsche med. Wochenschr.*, 1886) by a powder composed of hydrochloride of quinine and benzoin thrown within the nasal passages. An oleate of quinine forms the basis of an inhalant. Gargles of quinine are of old-time repute in the treatment of TONSILLITIS and DIPHTHERIA. Truman applies an ointment of quinine to FUNGOID GRANULATIONS OF THE GUMS and to all PURULENT CONDITIONS OF THE ORAL MUCOUS MEMBRANES. Tannate of quinine forms the basis of a lozenge, each lozenge to contain one to two grains in each mass.

Cinchona bark enters into the composition of many tooth powders.

RESORCIN.

When any one of a number of resins, galbanum, sagapenum, asafœtida, ammoniac, etc., are fused with potassium hydrate, an organic body is obtained which is resorcin. It is also obtained in other ways, notably by fusing sodium benzol disulphonate with caustic soda.

Resorcin is crystalline in structure, soluble in water, glycerin, and (to five per cent.) in olive oil. It is not soluble in chloroform or rhigolene.[*]

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[*] J. Andeer (*St. Petersb. med. Wochenschr.*, No. 22, 1890).

Resorcin is slightly antiseptic, parasiticide, and analgesic; its action resembles that of cocaine, but it is a much feebler agent. It is even said to be vesicant and caustic. Most of these properties exist rather as indications of the action of the drug than as actual qualities which may be made therapeutically useful. "Weak solutions harden the skin; strong ones macerate and destroy it." (Helbing.)

"Resorcin, when triturated in equal quantity with antipyrine, forms a honey-like paste." (M. B., August, 1891.) Its solution must be kept in dark bottles. (*Ibid.*, September, 1891.)

General Surgery.—Resorcin is non-irritant to the unbroken skin, and is not injurious to instruments. It is employed in surgical practice as a substitute for carbolic acid, but is inferior to this agent as an antiseptic.

The drug used should be snow white and colorless in solution. It should be dissolved in distilled water in the proportion of one per cent., and kept well corked in opaque bottles,—small quantities only being prepared at a time. A two per cent. solution succeeded in arresting HOSPITAL GANGRENE when other remedies had failed. (Hallopeau, *Soc. de Thérap.*, 1892.)

In the treatment of GONORRHŒAL CYSTITIS, with neutral or alkaline urine, a one per cent. solution of resorcin injected into the bladder relieves promptly. Leblond treats CHANCRE by dusting powdered resorcin on the ulcer each day, continuing the application as long as the base of the sore has a grayish color. Healing begins, as a rule, in five days. A dressing is then applied of a five per cent. solution. Abscess cavities are flushed with the solution named, and afterward dressed with the powder.

In the treatment of URETHRITIS, Mummich uses an injection of a three per cent. solution of resorcin. After the discharge has diminished, which is usually the case in four or five days, the number of injections is increased to three or four during the day and one at night, but soon the number is gradually diminished until the discharge ceases. It is well to continue the injections for some time after the cessation of the discharge.

Diseases of the Skin.—In its action upon the skin, resorcin belongs to the class of remedies known as "reducing agents," having the property of that form of chemical action upon the tissues. It is employed as a PARASITICIDE, also in SUBACUTE ECZEMA and CHRONIC ECZEMA in ULCERS,* and for softening HORNY GROWTHS, INFILTRATIONS OF THE SKIN and as a CAUSTIC in EPITHELIOMA.

Dreckmann (*Monatshefte f. prakt. Dermatol.*, Bd. x, 9, p. 389) uses resorcin in water-dressings. The affected region is covered with absorbent cotton-wool or lint soaked in a weak solution (five to thirty grains to the ounce) of resorcin in water, and over this a covering of impermeable material, as rubber cloth or oil-silk, is fixed. The lint is to be moistened from time to time with the solution. The method has the advantages of the water-dressing combined with the mild action of resorcin. It is especially useful in Horny Eczema of the Palm and Sole, and has also been found helpful in Pruritus Senilis. For Circumscribed Moist Eczema this dressing may also be used with advantage. Occasional inunction with fats will prevent too great maceration.

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* H. W. Stelwagon. *Jour. Cut. and Ven. Dis.*, 1886, p. 326.

Resorcin is occasionally employed either in the form of powder or in strong ointments for the relief of Epithelioma. The ointment should consist at first of equal parts of resorcin and vaseline, and is subsequently weakened. Eschars or sloughs form, which may be removed by applications of an ointment of iodoform and vaseline (ʒj–℥j).

We think, however, that resorcin is by no means sufficiently active to prove a useful remedy in epithelioma. We have other caustics, much more valuable, well known, and long tried, as caustic potassa and the stronger acids.

We have attempted the relief and the removal of tuberculous warts and ulcers—Tuberculosis Cutis—by means of resorcin, but without success. In such cases lactic acid has succeeded where resorcin has failed. (See *Acidum Lacticum.*)

Cæsar Boeck (*Monatshefte f. prakt. Dermatol.*, 1886, Bd. v, p. 93) recommends resorcin in powder, pure or mixed with sugar or boric acid, as an application in Pointed Condylomata, particularly of the genitals. A solution in ether and collodion, one drachm to six, may be used, though it is not so efficient as the powder. A solution of twenty to thirty grains of resorcin to the ounce of water is available where the skin is sensitive. As idiosyncrasy cannot be known beforehand the patient must be seen daily at first.

Similar preparations are employed in the treatment of Ulcers and Phagedenic Sores.

Diseases of the Ear, Nose, and Throat.—In the treatment of Chronic Suppuration of the Middle Ear, one part of powdered resorcin is added to eight parts of boric acid and dusted upon the affected surfaces. Pollitzer (*Rev. Mens. de Laryng. d' Otol. et de Rhinolog.*, October 15, 1889) recommends a three per cent. solution for irrigation of the middle ear in Inflammation of the Attic. C. Burnett employs a small quantity in finely pulverized boric acid as an insufflation to meet the same indications.

Resorcin is extensively used in the treatment of both Acute and Chronic Nasal Catarrh. A. B. Thrasher ("Trans. Ninth International Med. Congress," vol. iv, 1887) employs it in the treatment of Chronic Nasal Catarrh. It is helpful in the form of a lotion, of strength varying from two to ten per cent. Two grains to the ounce forms the basis of a lotion for PHARYNGITIS. E. L. Shurly (*N. Y. Med. Journal*, September 11, 1886) uses this agent in various conditions in PHARYNGITIS and SYPHILITIC ULCERATIONS, as well as in LUPUS. It may be directed in the form of a spray or ointment, one part to four or six. He employs it either in a pure form or in combination with tar water. In DIPHTHERIA the affected surfaces may be painted every hour with a ten per cent. solution of resorcin in glycerin.

In a solution of seven grains to the ounce, Sajous (*Jour. Amer. Med. Ass'n*, May 3, 1890) recommends it for reduction of HYPERTROPHIC ŒDEMA of the vocal cords in ACUTE LARYNGITIS. The writer claims that this is the limit to which the solution should be carried, since if the agent is used in greater strength it causes a sensation of dryness, while weaker solutions are ineffectual. The solution should be applied with an atomizer every two hours the first day, and afterward three times daily.

Tymonsky (*Monatsschrift für Ohrenheilkunde*, May, 1891, No. 5, p. 153) finds resorcin the most convenient remedy to use in the treatment of the ulcerative stage of LARYNGEAL PHTHISIS. Daily applications of an eighty per cent. solution are made.

On the whole resorcin appears to be adapted to subacute and chronic disease rather than acute. A scruple to the ounce of water has much the same effect as carbolic acid in the treatment of NASAL CATARRH. A five to ten per cent. solution can be sprayed in WHOOPING COUGH, ASTHMA, BRONCHITIS, LARYNGEAL ULCERS, etc. (A. Eichler, *Med. and Surg. Rep.*, 1891, No. 5.)

Resorcin enters into an antiseptic tooth-powder which is popular in France.

Diseases of the Eye.—Resorcin has been recommended as an antiseptic in ophthalmic surgery, but it has not been very much used. It is less irritating than carbolic acid, but probably less efficient as a germicide. A five per cent. solution is said to be very well borne by the conjunctiva. It may be applied to the edges of the eyelids in OPHTHALMIA TARSI in an ointment of one drachm to one ounce.

RETINOL. Rosinol. Resinol.

Retinol is a distillation product of *Burgundy pitch*. It was discovered by Pelletier and Walter in 1838. Retinol, when pure, is simply a hydrocarbon of the formula $C_{32}H_{32}$ in the form of a viscid fluid similar in appearance to castor oil, with a peculiar odor, and a specific gravity of 0.900; it boils at 238° C. (460.4° F.).

Retinol is a non-irritating and stable antiseptic. It is used as a solvent for phosphorus. It dissolves carbolic acid and creasote in every proportion. It is also a solvent in a lesser degree for camphorated naphthol, salol, camphor, cocaine hydrochloride, chrysophanic acid, iodol, naphthol, and aristol. It is not soluble in water. F. Vigier (*Bull. Gén. de Thérap.*, 1891, Nos. 5 and 7). The drug has as yet attracted little notice.

General Surgery.—Balzer and others have recently employed retinol in the treatment of VAGINITIS, SYPHILITIC and VARICOSE ULCERS, etc.

Retinol has been recommended as an antiseptic, and as a vehicle for the application of other antiseptics.

Diseases of the Skin.—In PRURITUS the following is said to give relief: ℞. Naphthol β, ℈j; retinol, saponis mollis, āā gr. cc; pulv. cretæ prep., ℈ij. M.

RHUS GLABRA. Rhus Glabra (Rhus Glabrum, Pharm., 1870). Sumach. Shumach.

"The fruit of *Rhus glabra*." (U. S. P.) Sumach berries, as they are commonly called, have a pleasant, sour, astringent taste. They contain free malic acid, malate of calcium, much tannic and gallic acid, a red coloring matter, and a volatile oil. While the fruit is the only official part of the plant, some practitioners prefer an infusion made from the inner bark of the root. The single official preparation is the fluid extract (extractum rhus glabræ fluidum), one cubic centimetre of which represents the activity of one gramme of the crude drug. An infusion is prepared by adding an ounce of the ripe berries or an equal amount of the inner bark of the root to a pint of water. A small proportion of alum is added with advantage.

Rhus glabra is an astringent.

Diseases of the Throat.—Rhus glabra is a valuable agent in the treatment of ACUTE INFLAMMATION, arising from any cause, of the mouth, tonsils, and pharynx. Thus it is one of the remedies for QUINSY. It is efficient in MERCURIAL STOMATITIS. The fluid extract, in the proportion of two drachms to four ounces of water, to which two scruples of potassium chlorate have been added, is one of the best of remedies when used as a gargle for ACUTE PHARYNGITIS. Lozenges of rhus glabra contain three grains of the extract in each mass. But fresh preparations are more efficient.

ROSA GALLICA. Red Rose.

"The petals of *Rosa gallica* collected before expanding." (U. S. P.) They contain gallic and tannic acid, a volatile and fixed oil, coloring matter, and other unimportant constituents. The following preparations are official:—

Confectio Rosæ. This is made by beating together red rose leaves, sugar, honey, and rose water; *Extractum Rosæ Fluidum* (one cubic centimetre representing the activity of one gramme of rosa gallica); *Mel Rosæ* (honey of roses), prepared by percolating red rose with diluted alcohol, evaporating to a fluid extract, and mixing eight parts of this with ninety-two parts of honey.

ROSA CENTIFOLIA. Pale Rose.

"The petals of *Rosa centifolia.*" (U. S. P.) It is from the petals of this rose that rose water (*Aqua Rosæ*) is made by distilling and redistilling water from the fresh petals. Rose water, however, is rarely, if ever, made in this country at all, but is imported from the south of France. Rose water ointment, or cold cream (*Unguentum Aquæ Rosæ*), is made by mixing thirty parts of rose water with an ointment composed of expressed oil of almond, spermaceti, and white wax.

Rose leaves and pharmaceutical preparations made from them form mildly aromatic astringent remedies. The *attar of rose* is employed to cover the odor of iodoform.

Diseases of the Throat, etc.—The compound infusion of rose is recommended by F. P. Atkinson (*Practitioner*, January, 1887, p. 38) as a gargle in FOLLICULAR TONSILLITIS. A lozenge is sold which contains two grains of powdered rose leaves, or one in which from one to four grains of rose leaves is in combination with from one to four grains of alum.

SABINA. Savine.

"The tops of *Juniperus sabina.*" (U. S. P.) The medicinal property of savine is due to its volatile oil, which is defined as "a volatile oil distilled from savine." Alcohol dissolves it freely. The Extractum Sabinæ Fluidum (one cubic centimetre of which represents the activity of one gramme of savine) is official.

Savine is an irritant.

General Surgery.—Savine is employed in the form of an ointment for the purpose of keeping up a discharge from blistered surfaces. For this purpose it is preferable to cantharides.

OLEUM SABINÆ.

Diseases of the Skin.—The only use of oil of savine in dermatology is as a stimulant in ALOPECIA "PITYRODES." Pincus, an excellent authority, has used it in the proportion of five to thirty drops in an ounce of alcohol. It is rubbed into the scalp, and also applied by compresses. Its action is simply that of a stimulant to the superficial cutaneous circulation.

SACCHARUM. Sugar. Cane Sugar.

"The refined sugar of *Saccharum officinarum.*" (U. S. P.)

White cane sugar, when finely pulverized, is a protectant, and by slowly dissolving in mucus increases its specific gravity. The first effect of sugar on inflamed tissues is to slightly irritate—this is probably due to the rapidity with which the agent imbibes moisture from the already partially dried and heated membranes. When diluted, one part to five parts of a light menstruum, such as magnesium carbonate, flowers of sulphur, or lycopodium, sugar is received without resistance upon the most sensitive tissues.

Sugar is preservative, when dissolved in the proportion of two pounds to a pint of distilled water, and hence can be said to be antiseptic.

General Surgery.—Donnhersser (*Schmidt's Jahrbücher*, July, 1889) commends sugar as a DRESSING FOR WOUNDS. It is dusted over the lesions, or applied in a sac made of sterilized muslin from which all oily matter is removed. In the treatment of TUBERCULAR ULCERS iodoform is mixed with sugar.

C. Ziem (*Monatssch. f. Ohrenheilk, etc.*, xxvi, 275) recommends mixing crude, unrefined honey with oatmeal to form a paste, for application to superficial inflammations. If abscess occurs the pus is evacuated by incision, and the dressing of honey-paste renewed. A similar use of honey for WHITLOW is an old domestic remedy in Germany.

Diseases of the Throat, etc.—In DIPHTHERIA sugar is often thrown upon the abraded surfaces of the tonsil after the removal of the exudate. To increase the specific gravity of a gargle sugar can take the place of glycerin.

THERIACA. Molasses. Treacle.

"The uncrystallized residue of the refining of sugar." (Ph. Br.) Two varieties of molasses are known—West India and sugar-house molasses. Each consists of uncrystallizable sugar, usually a proportion of crystallizable sugar, coloring matter, and water.

Molasses and other saccharine solutions are bland and unirritating, and when applied to cutaneous surfaces act as protectants.

General Surgery.—In domestic medicine molasses has attained some reputation as a dressing for BURNS, especially those of the first degree. It is conveniently applied by saturating old linen or lint, and then enveloping the injured part, or by dipping the affected surface in a vessel containing the molasses, then covering it with raw cotton, and retaining by a bandage. The cleansing of the burnt surface is at any time easily effected.

SACCHARUM LACTIS. Sugar of Milk.

Sugar of milk is obtained from the whey of cow's milk by evaporation, and purified by recrystallization. "Soluble in seven parts of water at 15° C. (59° F.), and in one part of boiling water; insoluble in alcohol, ether or chloroform." (U. S. P.)

Diseases of the Nose, Throat, etc.—Sugar of milk is often used as an excipient in diluting powdered tannic acid, borax, bismuth subnitrate, and nitrate of silver in insufflations to the nose, pharynx, and larynx.

SALOL. Phenyl Salicylate.

"Salol is a white, crystalline, coarse powder, with an odor of oil of wintergreen, and a slight taste of carbolic acid. It is sparingly, if at all, soluble in water; soluble in alcohol, ether, petroleum spirit, and fatty oils." (U. S. D.) Salol is soluble in retinol in proportion 1–10.

Salol is antiseptic. In external application it is a feeble agent. To some extent it may be accepted as a substitute for iodoform. It possesses advantages over this agent in having almost no odor, and being without toxic properties. Some observers are of the opinion that salol is inert unless it is decomposed, and that the efficacy it possesses is due to carbolic acid. That good results, however, have been secured by its use is proven by abundant testimony, and, it is claimed by European observers, that it may be used as a succedaneum for iodoform.

General Surgery.—Salol is recommended by Corner (*Lancet*, May 4, 1889) as a Dressing for Wounds, especially those which are associated with fracture and dislocation. The part is cleansed with a 1–20 solution of carbolic acid, and then dusted with powdered salol. Feilchenfeld (*Lancet*, March 20, 1887) has used salol successfully both internally and externally. In an obstinate case of Venereal Bubo, which had resisted the stronger caustics, salol was efficient.

Fato and Cabatelli (*Bulletin Médical*, February 10, 1889) use salol in the treatment of Burns, in the proportion of three parts of salol to one hundred parts of lanolin, the dressing being renewed every three days. The ointment allays pain and prevents inflammatory reaction. Kiezer (*Jour. Amer. Med. Assoc.*, ii, 1889, p. 927) treated with success an obstinate Varicose Ulcer by dusting with one part of salol to twelve parts of powdered starch.

Diseases of the Skin.—Salol has been used by Schwimmer as a substitute for iodoform in Venereal, Syphilitic, and Simple Ulcers with success. It is without disagreeable odor, and while not diminishing suppuration to a marked extent, acts favorably in suppurative sores and favors healthy granulation and the growth of epithelium. It is applied in powder, and may be combined with one-half its bulk of powdered starch to favor adhesion. Salol is not so effective when mixed with glycerin or in the form of ointment.

Saalfeld has employed salol (℞. Salol, ℈j–ʒss; vaselin, ℥j) in Eczema with excellent results. Also in Sycosis Simplex (Sycosis coccogenica).

Diseases of the Nose and Throat.—E. J. Frome (*La Tribune Médicale*, 1889) employs for Ozæna an ointment composed as follows: Salol, four grammes; oleum petrolatum, one hundred and fifty grammes. Salol is recommended by Beschorner (*Gesellschaft für Natur- und Heilkunde zu Dresden*, November 3, 1888) as an ingredient of a powder to be used by insufflation for Tubercular Laryngitis.

The following constitutes a mouth wash popular in Germany: Salol, two grammes; menthol, three grammes; ol. menth. piper, three grammes; spirit anisi, nine grammes; alcohol, two hundred grammes.

Salol enters into an antiseptic tooth-powder.

SALVIA. Salvia. Sage.

"The leaves of *Salvia officinalis*." (U. S. P.) Sage contains a volatile oil and tannic acid besides other unimportant constituents. The single official preparation into which it enters is Vinum Aromaticum. Sage is one of the ingredients of baume tranquille.

Sage is an aromatic astringent.

Diseases of the Nose and Throat.—Sage has been used for a long time in domestic practice in the form of an infusion ("sage tea"). An ounce of the leaves is added to a pint of hot water, honey, alum, and vinegar being added. Such a preparation is a cheap and efficient gargle for ACUTE INFLAMMATION OF THE MOUTH AND THROAT. D. H. Agnew (*Therapeutic Gazette*, 1885, p. 17) reports a case of CHRONIC CATARRHAL RHINITIS, accompanied with profuse purulent discharge, which yielded to douches of infusion of sage. An oil of sage is prepared, ten minims of which to an ounce of water in the presence of magnesium carbonate constitutes a stimulating inhalant.

SAMBUCUS. Elder.

"The flowers of *Sambucus canadensis*. Linn." (U. S. P.)

Elder is demulcent and protectant.

Diseases of the Nose, etc.—Extract of elder can be mixed in the proportion of four parts—alum two parts to a mass of sixteen parts of oleum petrolatum—to form an emollient and slightly astringent ointment, which is suitable for application to the interior of the nostril in ECZEMA.

SANGUINARIA. Sanguinaria. Blood Root.

"The rhizome of *Sanguinaria canadensis* collected in autumn." (U. S. P.) Sanguinaria contains an alkaloid, sanguinarine, which is "a white, pearly substance of an acrid taste, very sparingly soluble in water, soluble in ether, and very soluble in alcohol." (U. S. D.)

Sanguinaria is a stimulant and escharotic.

Diseases of the Nose.—In a pure form sanguinaria is a severe excitant to the nasal mucous membrane. Its violence is mitigated by mixing two drachms of the powder with twice the amount of pulverized acacia, or one part of sanguinaria may be added to three parts of starch. The powder thus formed is recommended by some practitioners to be blown within the nasal chambers in the dry form of ATROPHIC RHINITIS. A nasal bougie, designed to accomplish a similar purpose, is prepared by adding two minims of the fluid extract to each mass. The pure powder is asserted to be escharotic to fungoid conditions of the mucous membrane. The drug is little used.

SAPO. Soap.

"Soap is prepared from soda and olive oil. A white, or whitish solid, hard, yet easily cut when fresh, having a slight, peculiar odor, free from rancidity; a disagreeable, alkaline taste, and an alkaline reaction. Readily soluble in water and in alcohol." (U. S. P.)

Sapo Viridis. Green Soap.

"Soap prepared from potassa and fish oils. A soft, greenish-yellow, unctuous jelly, having a peculiar odor, which should be free from rancidity, and an alkaline reaction. Soluble in water and in alcohol, without leaving more than a small residue of insoluble matter." (U. S. P.)

Tinctura Saponis Viridis. Tincture of Green Soap.

"Green soap, sixty-five parts; oil of lavender, two parts; alcohol, a sufficient quantity to make one hundred parts. Mix the soap and oil of lavender with thirty-three parts of alcohol, and let the mixture macerate until the soap is dissolved; then filter through paper, adding alcohol through the filter, until one hundred parts of tincture are obtained." (U. S. P.)

Soap is solvent, antiseptic and detergent.

General Surgery.—Soaps are employed in general surgery for their detergent properties. For this purpose all that is necessary is a fairly pure article which is free from essential oils. Castile soap is the form in common use. At the Pennsylvania Hospital, a "soft soap" is prepared by dissolving Castile soap in water with the aid of a little heat; it is kept in a jar, and can be readily applied to the selected part upon a piece of oakum or cotton. After turpentine has been applied for the purpose of removing resinoid particles (as from old plasters or ointments), the skin should be washed with soap and water. If permitted to remain on the surface, the soap will often cause cutaneous irritation. In the stiffness following OLD SPRAINS and FRACTURES, so common in injuries about the wrist and ankle, especially in persons advanced in life, placing the part in as strong a bath of hot soapsuds as can be borne (while the limb is immersed, to employ a gentle massage and friction) is efficacious. The temperature of the bath should be maintained by frequent additions of hot water. Each manipulation should last for at least an hour. By pursuing this method of treatment hands and wrists whose functions have been destroyed are restored to comparative usefulness. In RECTAL and VAGINAL EXAMINATIONS, filling the subinguinal spaces with soap will prevent the lodging of unpleasant secretions. In CONSTIPATION, where a large mass of feces has lodged in the lower bowel, a copious enema of soap and warm water is useful (see *Aqua*). The soap should be dissolved freely, since it assists in lubricating the impacted masses, while it stimulates the bowel to contraction. In infants a small suppository of Castile soap, made by paring a piece to the required size, and gently inserting it beyond the sphincter, will usually have the desired effect. For disinfection of the hands excellent results can be obtained by the thorough use, with a stiff nail-brush, of a pure, non-odorous soap, and afterward employing an antiseptic. As a rule, such a course is to be preferred to the use of "medicated soaps." In the so-called bichloride of mercury soap the mercury forms an oleate which is not active as a germicide, while it may unite with albumin, which will render the soap useless. Advantage, however, has been taken of the solubility of the biniodide of mercury in iodide of potash; a soap thus prepared is known as the "soluble biniodide soap."

John Thompson (*Br. Med. Jour.*, May 12, 1888) states that one gramme of soap in 120 c.c. of water proved to be rapidly destructive of all infecting organisms.

Diseases of the Skin.—The ordinary soda-soap of the Pharmacopœia, "Castile soap," is an excellent detergent. It is used in dermatology to cleanse the skin of dried serum, pus, blood, and epidermic scales, the results of inflammatory action.

But the enormous increase in the number of spurious Castile soaps placed upon the market of late years renders it difficult to obtain a pure article. The practitioner should obtain samples of the purest soaps of a reliable pharmacist, and decide which best suits his purpose.*

Sapo viridis, on account of the excess of alkali contained, has a solvent effect on the horny layer of the skin, and exposes the lower layer of the epidermis. In CHRONIC ECZEMA, particularly when much itching results from the retention of exudations, this symptom may be relieved by sapo viridis well rubbed into the skin. The result of this application is to inflame the skin, and, therefore, so soon as the object of laying bare the lower layers of the epidermis is accomplished, as may be seen from the profuse oozing and weeping (with a slight bloody discharge), the soap should be completely washed off with warm water, and a soothing ointment, as the diachylon ointment of Hebra, or the oleate of bismuth ointment, (McCall Anderson's ointment) applied.

Sapo viridis is sometimes used in INFILTRATED ECZEMA and other chronically diseased conditions of the skin to remove infiltration, or, in other words, to act as a discutient. In employing soap in this manner it must be remembered that the *deep* effect is desired with as little irritation of the surface as possible. The soap, therefore, should be worked into the skin and not rubbed across its surface.

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* The best soap to use when the skin is highly inflamed and irritable is the "Basis-Seife" of Unna. This is said to contain an excess of fat, but the statement has been questioned. It is certainly more likely than any other soap to be neutral, and will be found a valuable agent in cleansing irritable surfaces.

The tinctura saponis viridis (U. S. P.) is essentially the same as the *spiritus saponus kalinus* of Hebra, excepting that the latter is made from the original sapo viridis as manufactured by the peasants of the Black Forest in Germany, and which is imported largely to this country. Although its composition may not be uniform, this soap is always to be preferred to the preparation of the U. S. P., whether for use in substance by itself or as the spiritus saponus kalinus.

Medicated soaps are those by means of which various drugs are brought into intimate contact with the skin, and, perhaps, also into a position where a certain amount of absorption can take place. Many of these have been pressed upon the attention of the medical profession, and their virtues have even been lauded by physicians of some note, especially in Germany, with much persistence. Medicated soaps, as a rule, are of poor quality and irritating to the skin. Those introduced by Unna and by Eichoff, and called "superfatted" soaps, are, however, made of excellent materials and by a scientific method, and are tolerated by the skin to a greater degree than any others. Unna's soaps are superfatted by the addition of an excess of olive oil up to four per cent. Eichoff's soaps are superfatted by a mixture of two parts of lanolin to three parts of olive oil up to five per cent.

Resorcin, salicylic acid, sulphur, tar, creolin, ergotin, creasote, menthol, ichthyol, benzoic acid, and other drugs have been introduced into these soaps, and within the restricted limit of their capacity for usefulness have proved valuable adjuvants in the treatment of skin diseases.

In all such affections of the skin as VESICULAR and PUSTULAR ECZEMA, ACNE, IMPETIGO, ECTHYMA, FURUNCULOSIS, ULCERS, etc., the use of an appropriately medicated soap forms a valuable preparation for the more active treatment to follow. As a means of introducing drugs into the general system, or even as a method of application when a deep action is desired, soap is not to be compared as a vehicle to fatty agents.

Under the name of "glycerinum saponatum," H. von Hebra describes a preparation which he considers useful in the treatment of skin diseases.

Chemically pure glycerin mixed with ninety-five per cent. cocoanut oil soap gives a solid body which becomes fluid when warmed. Castile soap can be substituted for cocoanut oil soap. The *saponated glycerin* is made by warming the dried soap with perfectly pure 28° B. glycerin (sp. gr. 1.242) over a warm bath and filtering while hot. It forms, when cold, a faint yellow, transparent, more or less elastic mass, which is almost colorless, and melts at the temperature of the body. A little of this preparation rubbed on the hands removes FISSURES and ROUGHNESS. It melts readily in water. Several medicated preparations of this saponated glycerin are described by Hebra.

A combination of twenty-four grains of salicylic acid to the ounce of this preparation makes a good application for the removal of excessive epidermic growth, as in TYLOSIS, CHRONIC ECZEMA, and is also an efficient parasiticide, in TINIA CIRCINATA and FAVUS.

Resorcin and salicylic acid, in the proportion of twenty-four grains of each to the ounce of saponated glycerin, forms a good combination. The base should be melted and the salicylic acid first incorporated, and then, at a lower temperature, the resorcin. Both dissolve entirely. This is an excellent application in PITYRIASIS CAPITIS, acting both as a soap and as an ointment.

Similar combinations can be made at will. (*Cf.* Hebra's article in *Sajous' Annual of the Univ. Med. Sci.*, Vol. IV, 1891, p. A 57. Also "Mollin" (p. 325) in this work.)

Diseases of the Mouth, etc.—Dental soaps dissolve fatty substances without attacking the teeth. They should have a neutral or slightly alkaline action. (W. D. Miller, "Microörganisms of the Human Mouth," 1890, 236.)

EMPLASTRUM SAPONIS. Soap Plaster.

Soap plaster is made by incorporating with ninety parts of lead plaster ten parts of soap. It has the physical qualities of lead plaster, but is believed by some to be more bland.

General Surgery.—Soap plaster should be spread on strong linen or thin leather (Chamois skin), and be one-eighth to one-fourth of an inch in thickness. It is employed in surgery to prevent abrasions and to protect from undue pressure. Much of the soap plaster sold in the shops is worthless, being but little better than adhesive plaster. Soap plaster has little adhesiveness, but when heated slightly beyond the temperature of the body easily conforms to any surface. It is a useful dressing in cases of threatened BED SORES when applied over the threatened region and retained by broad strips of adhesive plaster. In the treatment of sprains of joints an efficient support can be obtained from soap plaster moulded to the articulation and secured by a bandage. Should a resolvent effect be desired, the surface of the joint is painted with tincture of iodine before the soap plaster is applied, with the intent that the combination will result in the formation of iodide of lead. This is a favorite mode of treatment with Ashhurst. When splints are applied, as after the operation of resection of the knee, soap plaster is one of the best of supporting surfaces devised upon which to rest the limb.

A number of plasters in good repute in domestic medicine may be employed in the same manner as soap plaster. "Logan's plaster," consisting of two and one-half pints of sweet oil, four ounces of butter, twelve ounces of Castile soap, and sixteen ounces of litharge. This is boiled over a slow fire until it becomes of a dark brown color; sixteen ounces of carbonate of lead are then added, and the heat is continued until a suitable consistency is obtained; two ounces of mastich complete the mass.

SASSAFRAS.

"The bark of the root of *Sassafras officinalis.* Nees." (U. S. P.)

The following preparations of sassafras are official: *Mucilago Sassafras Medullæ;* and *Oleum Sassafras.* The mucilage of the pith is prepared as follows: "Sassafras pith, two parts (or thirty-six grains); water, one hundred parts (or four fluidounces); macerate for three hours and strain." (U. S. P.) The necessity of the long maceration is obviated by cutting the pith in very small portions and shaking it with the water; a few minutes suffices to make the mucilage by this plan. Oil of sassafras is "a volatile oil distilled from sassafras." (U. S. P.)

The bark is not employed as such in local therapy. The properties of the pith and the volatile oil are essentially different, yet it is convenient to treat of both under a single head.

Sassafras pith is demulcent. The oil is an aromatic stimulant.

Diseases of the Throat, etc.—Black (*Dental Review,* 1889) recommends for INFLAMMATION OF THE GUMS due to bacteria, and accompanied with fetor, a mixture composed of three parts of oil of sassafras, two parts of wintergreen, and one of carbolic acid. Oil of sassafras enters into the composition of the official trochisci cubebæ. Lozenges are sold which contain from one-tenth to one-sixth of a minim of the oil in each mass.

Diseases of the Eye.—Mucilage of sassafras pith is a popular domestic remedy in the treatment of injuries of the eye and ACUTE CONJUNCTIVITIS. Cloths wet with it are kept upon the closed eyelids, or it is applied to the conjunctiva. It is soothing when freshly applied, but should not be allowed to dry upon the lashes, as it stiffens them disagreeably, and may even glue the lids together if not well diluted. Half an ounce of the official mucilage to from three to six ounces of water makes an agreeable addition to washes of borax, boric acid, or alum.

SCOPOLENINE.

An alkaloid present in Japanese belladonna (*Scopolia Japonica*).

Diseases of the Eye.—Pierdhony (*Noveaux Remèdes,* 1886, No. 3, p. 61) states that the mydriatic form of scopolenine is superior to that of atropine, and recommends its use in ophthalmic practice. He also claims that it is free from liability to produce the conjunctival irritation which sometimes follows the use of atropine. As, however, this effect of atropine is only met with exceptionally in a very small proportion of the enormous number of cases in which the drug is daily used, this claim can have no basis until scopolenine has been much more extensively tested. It has not been much used in practice.

SINAPIS ALBA.

"The seed of *Sinapis alba*. Linn." (U. S. P.)

SINAPIS NIGRA.

"The seed of *Sinapis nigra*. Linn." (U. S. P.)

It is convenient to treat of the two forms of mustard under a single article.

Sinapis is rubefacient and vesicant. Powdered mustard, applied locally to the skin, acts as a decided irritant. Any degree of effect may be produced by it, from moderate excitement to severe blistering.

General Surgery.—On account of its convenience, mustard is extensively used in domestic medicine; it is one of the most available substances to produce a mild revulsive effect. Mustard should not be permitted to vesicate, since the pain occasioned is severe, the serous discharge slight in amount, and the resulting ulcer difficult to heal. Mustard is usually employed in the form of a plaster, made by incorporating equal parts of the powdered mustard with ground flaxseed or flour, and bringing it to the proper consistency with tepid water. The mass is then spread upon a piece of old muslin, covered with a portion of the same material, and applied to the selected part. Another "convenient method is to take a newspaper, folded to a little larger than the desired size, and tear open the front piece so that it can be folded back like a flap, leaving one edge attached; next, to spread upon the thick portion the mustard, leaving the edges free, and then to close the flap upon it and fold the edges back to the desired shape." (H. C. Wood, "Therapeutics.")

"Mustard leaves" are for sale, and are much employed in place of the mustard plaster. They require only to be moistened before being used. As a rule, the effects of the "mustard leaves" are more severe than are those of the plaster, and it is often necessary to apply two or three layers of muslin or paper between them and the skin. In this way they can be borne for a long time, and the results are more persistent. When a mustard plaster is applied to affect deep-seated organs, as in PNEUMONIA, PLEURISY, or PERITONITIS, such action is desirable. In BRONCHITIS in children, accompanied with congestion, the entire chest may be enveloped in a jacket-plaster or poultice for a short time, in order to thoroughly redden the skin. On the removal of the plaster the parts should be sponged off with tepid water and the chest wrapped in raw cotton. A mustard bath, in the strength of a drachm to the gallon, when properly used, is of service, especially in children, upon the recession of the RASH IN MEASLES OR SCARLET FEVER. The familiar mustard foot-bath is of service in aiding the breaking up a COLD, or in relieving a CONGESTIVE HEADACHE, although the application of a mustard plaster to the nape of the neck, as a rule, will be more effectual. In OBSTINATE VOMITING one can derive benefit from the application of a mustard plaster to the epigastrium. The mustard hip-bath is of service in arrested CATAMENIA, and may be used to redden the thighs and buttocks a few days before and during the missing period. The patient should remain from a half hour to an hour, twice daily, in the bath. In ULCERATING UTERINE CARCINOMA benefit has been derived by using a vaginal douche of hot water (see *Aqua*, p. 96) to which a little mustard has been added, of sufficient strength to produce a slight sense of tingling.

SODA. Sodii Hydras. Caustic Soda.

Sodium hydrate is prepared by boiling together slacked lime and solution of sodium carbonate. The resulting solution is separated from the sediment, evaporated, and cast into sticks. It is often known in the shops as stick-soda. The purified compound is prepared by dissolving the commercial caustic soda in alcohol, which forms a clear solution of the pure sodium hydrate, while the impurities remain undissolved and subside. The solution is evaporated in a silver dish and moulded into sticks.

Sodium hydrate is soluble in 1.7 parts of cold water and 0.8 part of boiling water; it is very soluble in alcohol.

SODII BENZOAS. Benzoate of Sodium.

"A white, semi-crystalline, or amorphous powder, efflorescent on exposure to air; odorless, or having a faint odor of benzoin; of a sweetish, astringent taste, free from bitterness, and having a neutral reaction. Soluble in 1.8 parts of water, and in forty-five parts of alcohol at 15° C. (59° F.), in 1.3 parts of boiling water, and in twenty parts of boiling alcohol." (U. S. P.)

Benzoate of sodium is antiseptic in the proportion of twenty grains to the ounce of water. Prosser James (*Lancet*, July 4, 1885) states that it possesses anæsthetic and analgesic properties.

Diseases of the Nose and Throat.—A solution of ten to twenty grains to the ounce is antiseptic and stimulant. It also makes an agreeable impression on inflamed surfaces of the throat, and overcomes the sense of constriction and dryness which is so commonly complained of in these conditions. Brondel (*Gazette des Hôpitaux*, December 11, 1886) recommends highly the use of a powder containing ten per cent. benzoate of sodium for local application to the tonsils in DIPHTHERIA. He claims that in its use exudates become less adherent and hygroscopic, and are detached, leaving the surface beneath cicatrized. In the proportion of six grains to the ounce of water, to which a small proportion of chlorate of potassium and glycerin has been added, Shuriy recommends benzoate of sodium as a spray for ACUTE INFLAMMATION OF THE THROAT AND NOSE.

SODII BICARBONAS. Sodium Bicarbonate. Bicarbonate of Sodium. Bicarbonate of Soda. Baking Soda.

A practically pure bicarbonate of sodium is contemplated—extraneous matter not more than one per cent. It is described as "soluble in twelve parts of water at 15° C. (59° F.) and insoluble in alcohol; it is decomposed by hot water." (U. S. P.) Sodii Bicarbonas Venalis is official. It contains not more than ninety five per cent. of the pure salt. It is rarely used. When bicarbonate of sodium is administered with hot water a caustic solution of carbonate of sodium is formed. Bicarbonate of sodium enters into the composition of Dobell's solution.

Bicarbonate of sodium is antacid, protectant, mildly antiseptic, and detergent.

General Surgery.—Bicarbonate of sodium in saturated solution has been lauded as a dressing for BURNS. It is much inferior to carron oil or ointment of oxide of zinc, in burns of the first and second degree. In INFLAMMATORY RHEUMATISM involving the articulations benefit can be derived from enveloping the parts in lint saturated with a solution composed of bicarbonate of soda, ten grains; tincture of opium, one fluidrachm; water, one fluidounce. The dressing is covered with raw cotton. In GONORRHŒA Castellan (*Journ. of Cutan. and Gen.-Urin. Dis.*, 1887) injects a solution of bicarbonate of sodium, eight to ten per cent., three to four times a day; the treatment is based on the hypothesis that while gonococci thrive in an acid medium they soon die in one which is alkaline. The discharge even in chronic cases became alkaline in a week, lessened rapidly, and soon stopped.

Diseases of the Skin.—Borax is sometimes substituted for the bicarbonate of soda and carbonate of soda, but possesses no advantage over these preparations.

Diseases of the Ear, Nose, and Throat.—Bicarbonate of sodium neutralizes acid secretion and increases the specific gravity of mucus formed in acute inflammation. The older writers believed that this agent liquefied tenacious mucus, and thereby enabled the patient to more easily remove it. But one to two per cent. solutions of this agent were observed by M. J. Roosbach (*Berliner Wochenschrift*, 1882, No. 19) to make scarcely any change on the mucous lining of the trachea of a living cat, while A. H. Buck (*Trans of the Amer. Otological Soc.*, 1873) concludes that even saturated solutions have no influence as solvents over abnormal mucoid masses. On theoretical grounds, therefore, the usefulness of sodium bicarbonate in the treatment might be disputed, but long experience has fixed its value as an efficient agent in Catarrhal Irritations. Five to twenty grains to the ounce of water are indicated in Otitis Media accompanied with purulent discharge. The solution should be gently warmed and thrown up the Eustachian tube or instilled in the external meatus. Hinton removes collections of inspissated mucus by copious irrigation of a solution similar to the one named, the fluid passing from the external meatus to the middle ear, and thence by the Eustachian tube to the pharynx. The parts being thus washed out every other day for a fortnight, are prepared for subsequent treatment by astringents or desiccants. Dissolved in a mucilaginous medium, such as flaxseed makes, sodium bicarbonate proves to be a useful lotion in Eczema of the External Auditory Passage. In the proportion of four grains to the ounce of water it is recommended by Miot and Baratoux (*Rev. Gén. de Clin. et de Thérap.*, January, 1889, p. 43) in diffuse Acute Inflammation of the External Auditory Meatus. Ten grains to the ounce of water, to which a drachm of glycerin is added, may be used in softening Hardened Cerumen. Miot (*Rev. Mens. de Laryngologie*, etc., No. 4, 1885). As the ingredient of a snuff it enters into a number of proprietary medicines, among which, particularly, may be mentioned Weidemeyr's snuff, which is alleged to be composed of sodium bicarbonate mixed with a little powdered cochineal.

As a nasal wash five grains to the ounce of water makes an efficient wash in Nasal Catarrh, accompanied with thick secretion. It is one of the ingredients in "Dobell's solution." Sodium bicarbonate in union with sodium chloride and salicylic acid forms a useful compound in the treatment of Atrophic Rhinitis. C. Seiler (*Med. Rec.*, February 18, 1888, p. 182) has proposed that the bicarbonate of soda be one of the ingredients of a lotion which is composed as follows: Sodium bicarb., ʒviij; sodium bibor., ʒviij; sodium benzoate, sodium salicylas, āā, gr. xx; eucalyptol, thymol, each gr. x; menthol, gr. v; oil of wintergreen, gtt. vj; glycerin, ℥viiss; alcohol, ℥ij; and water, q. s. to make 16 pints.*

Forcheimer (*Archives of Pediatrics*, February, 1889) recommends that before an antiseptic wash be employed in the mouth for the removal of fungi, as in Thrush or Aphthæ, the parts be carefully washed with a weak solution of bicarbonate of sodium. This agent has long had a reputation for the cure of Tonsillitis. The patient may rub the tonsil with the finger, which has been previously moistened with a quantity of the salt According to W. J. Baker (*British Medical Journal*, April 9,

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* These ingredients enter into the composition of "Seiler's Antiseptic Tablet."

1887), if this procedure be repeated every five minutes the first hour and every hour for the rest of the day it will give relief even under conditions when suppuration seems to be inevitable. S. Michailoff (*Meditsina*, No. 21, 1889, p. 4) recommends the powdered salt in GRANULAR TONSILLITIS and PHARYNGITIS. The author appears to have had extensive experience and claims that improvement always ensued; a majority of cases were cured by the treatment, the period varying from a fortnight to six weeks. The author appears to especially allude to the large tonsils of childhood. Rovira y Oliver (*Gaceta Medica Catalana*, No. 7) confirms the above statement. He attributes the efficacy to the neutralization of the acidity of the secretion as well as to the solvent impression on the tenacious mucus of the crypts. The agent should be applied every two or three hours. The author mentions a toxic impression by over-use, but does not give details. A five to ten per cent. solution of bicarbonate of sodium spoken of by W. D. Miller ("Micro-organisms of the Human Mouth," *loc. cit.*) as the best application for THRUSH. The salt constitutes the basis of a lozenge, each mass to contain three grains of the drug.

SODII BISULPHIS. Bisulphite of Sodium.

"Opaque, prismatic crystals, or a crystalline or granular powder, slowly oxidized and losing sulphurous acid on exposure to air, having a faint, sulphurous odor, a disagreeable, sulphurous taste, and an acid reaction. Soluble in four parts of water and in seventy-two parts of alcohol at 15° C. (59° F.); in two parts of boiling water and in forty-nine parts of boiling alcohol." (U. S. P.) The fresh salt of sodium bisulphite must be used in therapeutic combinations.

Diseases of the Skin.—A five per cent. solution of the bisulphite of sodium in combination with one per cent. solution of carbolic acid has been used in the DERMATITIS from *Rhus toxicodendron*.

SODII BORAS. Borate of Sodium. Borax.

Borax "is soluble in sixteen parts of water at 15° C. (59° F.), in 0.5 part of boiling water; insoluble in alcohol. At 80° C. (176° F.) it is soluble in one part of glycerin." (U. S. P.) Borax enters into the composition of Dobell's solution. The presence of borax increases the solubility of boric acid. M. Jaenicke, by dissolving equal parts of borax and boric acid in boiling water, produced a preparation known as *boro-borax*. It resembles boric acid, but is of greater solubility.

Borax in its action is not unlike boric acid. It is absorbent, antiseptic, and sedative. In the form of a powder it is, in addition, absorbent, and protectant, hence it is of value in treating acute inflammations of the mucous surfaces.

General Surgery.—The ERUPTION which appears on the mucous membrane of the VULVA in young girls, and sometimes extends up as far as the cervix uteri, can be cured, according to Sir James Simpson, by the injection of a solution of borax, five to ten grains to the ounce of hot water. In LEUCORRHŒA an injection of a quart of hot water, in which a couple of drachms of borax have been dissolved, is of service. In this connection borax is an efficient succedaneum for alum or tannic acid. In CHRONIC CYSTITIS, Sir H. Thompson commends an injection composed of borax, one ounce; glycerin, two ounces; of the mixture two or three drachms can be added to four ounces of water. In GONORRHŒA a solution of from ten to fifteen grains to the ounce of water has been employed with benefit.

Diseases of the Ear, Nose, Throat, etc.—Two grains of borax to the ounce of water, to which a little glycerin has been added, is a favorite prescription for cleansing the naso-pharynx. As an insufflation in irritated states of the mucous surfaces of the nose and throat, three grains may be used at a time. Each ounce of water in a lotion may contain five grains of borax. A preparation of similar strength is injected in the Eustachian tube for CATARRHAL DEAFNESS. The slightly alkaline reaction obtained aids in restoring a neutral or acid secretion to one of normal character, at the same time that the solution gives increased density to the thin, irritating discharge of an ACUTE NASAL CATARRH. It may be used alone, but is commonly exhibited with drugs having a somewhat similar effect. The following is efficacious in CHRONIC NASAL CATARRH accompanied with infiltration: Two ounces each of borax and sodium chloride, and ten grains of benzoic acid. A half drachm of this powder is added to a glass (half pint) of warm water, in which a little glycerin has been stirred. To be used freely. One of the most common uses of borax is in the removal of APHTHÆ which affects the mouths of nursing children. Dewees employed equal parts of borax and finely-powdered sugar, dusted over the part every two or three hours. A pinch of the preparation, in lieu of the above, may be placed on the tongue. A mixture of honey and borax (mel boracis, Br. Ph.) is popular. In CRACKED TONGUE, Brinton found the following of service: Borax, forty grains; glycerin, one ounce; water, four ounces. Employ as a wash. Borax enters largely into the composition of gargles prescribed for INFLAMMATION OF THE PHARYNX. It is also an ingredient of a lozenge containing two to three grains.

Diseases of the Eye.—Borax forms an excellent aseptic application in CONJUNCTIVITIS. It may be advantageously combined with boric acid. Five grains of borax and ten of boric acid to the ounce of water make an agreeable and useful wash, particularly in the ACUTE FORM OF CONJUNCTIVITIS. In the CHRONIC FORMS it may be used frequently and freely by the patient in addition to other applications made at longer intervals by the surgeon.

SODII CARBONAS. Carbonate of Sodium. Washing Soda.

Carbonate of sodium is prepared on a very large scale from the common salt of sea-water and from cryolite, a mineral found in Greenland. Carbonate of sodium is official in a crystalline form, with 62.9 per cent. of water of crystallization, and as a dry, white powder, *sodii carbonas exsiccatus*, in which fifty per cent. of the water has been removed by heat.

The crystals effloresce on exposure to dry air, and fall to a white powder. They are soluble in 1.6 parts of water at 15°, and in 0.25 part of boiling water. A fragment of the salt imparts an intense yellow color to a non-luminous flame.

Diseases of the Skin.—The carbonate of sodium in lotions is sometimes employed in inflammatory skin diseases, although inferior to most other local applications commonly used. It is dissolved in water in the proportion of two to three drachms to the pint, and applied on cloths as an evaporating lotion.

"Washing soda" is added to a bath in the proportion of four ounces of the salt to thirty gallons of water in the treatment of ECZEMA and other inflammatory types of diseases in which PRURITUS is a conspicuous symptom.

Carbonate of sodium may be used to advantage for the purpose of softening the crusts in INFANTILE ECZEMA CAPITIS, applied on cloths and covered with oiled silk. If combined with an antiseptic and deodorant it prepares the way for subsequent active medical treatment. The following formula may be used: ℞. Sodii carb., ʒj; liq. sodæ chlorinat., f℥j; aquæ, ad. f℥xij. M.

SODII CHLORIDUM. Chloride of Sodium. Table-Salt.

"It is soluble in 2.8 parts of water at 15° C. (59° F.) and 2.5 parts of boiling water; almost insoluble in alcohol." (U. S. P.)

Common salt applied to the skin acts as a rubefacient and stimulant. It has long been recognized as possessing antiseptic properties, and hence it is extensively employed for the preservation and packing of meats. It is also solvent and protectant. Sea-salt, made by evaporating sea-water, is employed in the proportion of one pound to four gallons of water. This gives about the strength of sea water, and is regarded as a valuable tonic and excitant in depraved states of the system, especially in children.

General Surgery.—As a means of removing the ECCHYMOSIS following contusions, especially what is known as a "*black eye*," an efficacious mixture consists of table-salt, three drachms; chloride of ammonium, one drachm; dissolved in six ounces of bay water; lint or old linen rags to be saturated and kept constantly over the part. In the treatment of the STINGS OF INSECTS, such as bees, wasps, etc., a saturated solution of table-salt used as a lotion will afford relief. An application of solution of ammonia is, on the whole, more efficient. Table-salt is often applied to leeches to cause them to cease biting. Solutions injected into the rectum will dislodge leeches which sometimes make their entrance while the individual is bathing. Salt given in an enema of water to children is an effectual remedy for THREAD WORMS. A few ounces of a solution of sodium chloride, in strength of a drachm to a pint of warm water, is highly commended by Reginald Harrison as a solvent for the tenacious cystic mucus so frequently found associated with enlargement of the prostate gland. A similar lotion is of value in removing masses of dried secretion on muco-cutaneous surfaces.

Diseases of the Skin.—As a stimulating bath chloride of sodium is employed in the strength of eight pounds to thirty gallons of water, which is about the strength of sea water.

Its employment in baths as an application to various skin diseases, particularly ECZEMA, has been strongly urged by Piffard (*Jour. Cutaneous and Venereal Diseases*, v, 1887, p. 421). He says that the addition of half a pound to a pound of rock-salt to a bath of twenty-five gallons makes the water agreeable instead of being irritating to the skin of eczematous patients. A proportion of ten pounds of salt to the bath is, according to Piffard, appropriate in FURUNCULOSIS, SUBACUTE ECZEMA, PSORIASIS, the IRRITABLE SUMMER RASHES, in URTICARIA, in the SCROFULODERMATA, and ULCERATIVE SYPHILODERMATA.

Diseases of the Ear, Nose, and Throat.—A solution of five grains to the ounce may be injected into the tympanic chamber in PURULENT OTORRHŒA. Largely diluted—two drachms to the pint—chloride of sodium is used to dislodge tenacious mucus. It forms a cheap and convenient remedy, but is open to the objection that, when the agent is habitually employed, the membranes lose tonicity. Weak lotions counteract the over-effects of application of nitrate of silver. By increasing the specific gravity of the thin, acrid discharges of ACUTE CORYZA solutions of chloride of sodium may be added to the list of remedies for this disease. It is an ingredient of the popular mixture of carbolic acid, borax, and bicarbonate of soda in the treatment of CHRONIC NASAL CATARRH. Valentin (*Correspondenzblatt für schweizer Aerzte*, No. 5, 1887) treats OZÆNA by irrigating with salt solution. A spray of from five to ten grains to the ounce is an admirable adjuvant in the treatment of CHRONIC LARYNGITIS accompanied by diminished secretion.

Diseases of the Eye.—Common salt is a favorite domestic remedy in mild cases of CONJUNCTIVITIS, and a very good one. About ten grains to the ounce of water is a good proportion, and the eyes may be bathed with it frequently and freely. A weak solution is, perhaps, the best fluid for washing out the anterior chamber after extraction of cataract. Three grains to the ounce is about the proportion of salt in the normal aqueous humor.

SODA CUM CALCE. Soda with Lime. London Paste.

The National Formulary directs that London paste be made by mixing equal parts of soda and lime in fine powder. It is sold either in the form of powder or small crayons.

London paste is a powerful caustic. Its action is similar to that of *potassa cum calce* (q. v.), but is claimed to be less diffusive, and, therefore, safer. When moistened with alcohol it is an efficient caustic to apply to small areas within the external auditory meatus.

Diseases of the Nose, etc.—M. Mackenzie recommends London paste for the destruction of HYPERTROPHIES BOTH OF THE NASAL CHAMBERS AND TONSILS. It is, however, inferior to chromic acid, acetic acid, or the galvano-cautery, but is efficient, through persistent use, in reducing the size of the fibroid masses.

SODII ETHYLAS. Ethylate of Sodium. Sodium Alcohol. Caustic Alcohol.

Ethylate of sodium is made by dropping small pieces of metallic sodium into absolute alcohol kept at a temperature of 50° F. until reaction ceases; the liquid is then heated to 100° F., and sodium again added; it is again cooled to 50° F. and the same quantity of absolute alcohol added as that with which the process started. The product is a fifty per cent. solution of ethylate of sodium. It should be kept in a cool place in a well-stoppered bottle, and applied either by a glass rod or piece of dry wood.

A solid form of the ethylate of sodium is available.

B. W. Richardson (*Proc. Br. Ass'n Ad. Sci.*, 1870, and *Pharm. Jour. and Trans.*, 1878, IX, p. 485), who introduced ethylate of sodium to the profession, states that the sodium is oxidized by the oxygen of the water of the tissues to form sodium hydrate, the hydrogen of the water going to reconstitute the common or ethylic alcohol.

Diseases of the Skin.—Richardson (*loc. cit.*) commends this caustic in the treatment of some diseases of the skin.

Applied to dry parts of the body surface it is comparatively inert, causing only slight tingling and redness. But, so soon as the part to which it is applied gives up a little water, caustic soda is produced in contact with the skin in proportion as water is eliminated, and there proceeds a gradual destruction of tissues which may be moderated so as to be scarcely perceptible, or may be so intensified as to act almost like a cutting instrument.

The action of the sodium and potassium alcohols is less painful than would be expected, and when pain is felt it may be quickly checked by dropping upon the part a little chloroform, which decomposes the ethylate. The addition of an alcoholic solution of opium, likewise, is said to lessen the pain of the application.

Ethylate of sodium may be applied upon surfaces rendered anæsthetic by cold, either by the application of ice or frozen by rhigolene spray.

The action of ethylate of sodium on the blood is, according to Richardson, rapid and marked. The red corpuscles are brought into a state of solution, crystallization of the hæmatin and related substances almost instantly takes place, while the white corpuscles are acted on very slowly.

Ethylate of sodium may be kept in a solution of half saturation in a glass-stoppered bottle, and should be applied by means of a glass rod, the end of which is somewhat pointed.

It has been used successfully in the removal of small and moderate-sized NÆVI and TELANGIECTASES. A thin, dry eschar is formed. After some days this can be removed and further applications made until the growth is destroyed. It leaves a smaller cicatrix than that produced by any other caustic. It has also been recommended in NÆVUS, EPITHELIOMA, LUPUS, and other new growths, but it has not proved superior to other agents of its class in the cure of these affections.

Diseases of the Nose.—The caustic effect of the sodii ethylate appears to be more manageable than that of caustic potassa. Richardson (*loc. cit.*) (*The Asclepiad*, 1, No. 3, 1884) recommends it for the destruction of NASAL POLYPUS. The following direction is abridged from this writer's statements: Saturate a piece of cotton with sodium ethylate and apply to the selected spot for two or three minutes, and withdraw. The mass of polypi may be almost immediately destroyed; then touch lightly the bases of the outgrowths with the same material. The application is described as being accompanied with slight burning pain, though occasionally moderate hemorrhage ensues.

SODII HYDRAS. Hydrate of Sodium. Caustic Soda.

General Surgery.—Caustic soda, being less deliquescent, possesses some advantages over caustic potassa. The indications for the use of these agents are in all respects similar.

SODII HYPOSULPHIS. Hyposulphite of Sodium. Sodium Thiosulphate.

Hyposulphite of sodium, which is more correctly called sodium thiosulphate, is prepared by boiling a solution of carbonate of sodium with sulphur.

The purified product occurs in "large, colorless, transparent, monoclinic prisms or plates, efflorescent in dry air, odorless, having a cooling, somewhat bitter, and sulphurous taste, and a neutral or faintly alkaline reaction. Soluble in 1.5 parts of water at 15° C. (59° F.), and in 0.5 parts of boiling water, in the latter case with partial decomposition; insoluble in alcohol." (U. S. P.)

Hyposulphite of sodium is antiseptic and is destructive of parasitic fungi of the tricophyton group. It is mildly analgesic.*

General Surgery.—Polli, of Milan, employs hyposulphite of sodium in the treatment of zymotic diseases, such as ERYSIPELAS, etc., in solutions of the strengths of one to two ounces to the pint of water. It is also a reliable preservative. The same writer states that corpses can be kept for anatomical purposes for weeks in solutions of the hyposulphite of sodium without undergoing change in color or density. In GANGRENOUS and FOUL ULCERATIONS a solution of the drug, one to five or ten parts of water, and kept in contact with the involved surfaces by lint, corrects fetid odor and establishes a healthy action. Injections of weak solutions of the hyposulphite of sodium are productive of good results in CHRONIC CYSTITIS, a disease which so frequently accompanies enlargement of the prostate gland, with resultant retention and decomposition of urine.

Diseases of the Skin.—The hyposulphite of sodium is employed as a parasiticide in the VEGETABLE PARASITIC DISEASES OF THE SKIN. In TINEA VERSICOLOR and in TINEA TRICOPHYTINA CRURIS, and other forms of ringworm the remedy is of decided value. It is usually employed in ointment or in a watery solution, one drachm to the ounce. Although mild in its effects, it has the advantage over most of the other vegetable parasiticides of being quite innocuous and unirritating. The following formula was recommended by Tilbury Fox, not only for the affections above named, but also in PRURITUS VULVÆ: ℞. Sodii hyposulphitis, ʒiv; glycerini, f℥j; aquæ, q. s. *ad* f℥vj. M. Sig.—Lotion.

Diseases of the Throat, etc.—Thirty grains of the hyposulphite of sodium added to an ounce of water forms a gargle suitable for use in DIPHTHERIA. (Potter.)

SODII SALICYLAS. Salicylate of Sodium.

"Small, white, crystalline plates, or a crystalline powder permanent in the air, odorless, having a sweetish, saline, or mildly alkaline taste, and a feebly acid reaction. Soluble in

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* A similar effect may be obtained with the sulphite of sodium, *q. v.*

1.5 part of water and in six parts of alcohol at 15° C. (59° F.); very soluble in boiling water and in boiling alcohol." (U. S. P.)

Salicylate of sodium is an antiferment and possesses antiseptic properties, though not to the same extent as does salicylic acid. It is slightly analgesic. (Prosser James, *Lancet*, July 4, 1885.) It is unirritating and readily absorbed.

General Surgery.—Inglessis has employed a six per cent. solution in glycerite of salicylate of sodium in the treatment of Erysipelas, the affected part to be covered with lint saturated with the solution, and then covered with raw cotton.

Diseases of the Nose and Throat.—Since in the internal treatment of Rheumatic Affections salicylate of sodium is of repute, it has been assumed that the same remedy would be valuable in the local treatment of Acute Rheumatic Pharyngitis and Laryngitis. The drug serves a useful purpose in Nasal Diphtheria in a wash in the proportion of twenty grains to the ounce. A. C. Baily (*Boston Med. and Surg. Journ.*, October 25, 1888) employs a gargle for Pharyngitis in the proportion of five grains to the ounce of water.

SODII SILICAS. Silicate of Sodium. Silicate of Soda. Liquid Glass.

"Silicate of sodium (Na_2SiO_3, or frequently $Na_2Si_4O_9$) is made by fusing one part of silica, fine sand, or powdered flint and two parts of dried carbonate of sodium, mixed in powder, in an earthenware crucible, and pouring out the fused mass on a stone slab to cool. This is pulverized and treated with boiling water to dissolve the soluble part. The solution is filtered and concentrated, so as to form crystals on cooling. These are then purified by dissolving them in water heated to 37.7° C. (100° F.), filtering the solution, and concentrating it so that it may recrystallize. The commercial solution of silicate of sodium usually contains about twenty per cent. of silica and ten per cent. of soda." (U. S. D.)

Silicate of sodium is protectant. It is employed for the same purposes as are starch and plaster-of-Paris in fixing dressings.

General Surgery.—Silicate of sodium is employed satisfactorily in retaining in position the turns of the bandage adapted to make extensions on the thigh, either in fracture of the femur or hip disease. After the dressings are adjusted the bandaged portion of the limb is brushed over with the solution, which is allowed to dry. Each individual turn of the bandage is thus fixed, so that a single application of the agent suffices during the treatment. When it is desired to secure more than ordinary rigidity the following plan is recommended: The limb is first enveloped in a roller bandage; over this is applied (preferably with a brush) a solution of silicate of sodium, having a syrupy consistence. A second roller bandage is then adapted to the parts, and it in turn is covered with the liquid glass solution. The slow rate at which the preparation dries (namely, from six to twelve hours) constitutes the main objection to the use of this agent. Of late years it has been nearly supplanted by the more rapidly-setting plaster of Paris.

SODII SULPHIS: Sodium Sulphite. Sulphite of Sodium. Sulphite of Soda.

"Colorless, transparent, monoclinic prisms, efflorescent in dry air, odorless, and having a cooling, saline, and sulphurous taste and a neutral or feebly alkaline reaction. Soluble in four parts of water at 15° C. (59° F.), and in 0.9 parts of boiling water; only sparingly soluble in alcohol." (U. S. P.)

Sulphite of soda is germicide.

General Surgery.—Sulphite of soda has been advocated by J. C. McMullen in a solution of ten grains to the ounce of water as an injection in the treatment of GONORRHŒA.

Diseases of the Skin.—The sulphite of sodium is sometimes employed instead of the hyposulphite, but it possesses no advantage above the former preparation.

Diseases of the Mouth, Throat, etc.—One drachm to the ounce of water can be used as a gargle in STOMATITIS and as an application to APHTHÆ (W. Jenner, *Med. Times and Gaz.*, VII, 1853, 183), MUCOUS PATCHES, ULCERS OF THE TONSILS, and DIPHTHERIA. A similar solution is used in NASAL DIPHTHERIA. (Potter.)

SODII SULPHOCARBOLAS. Sulphocarbolate of Sodium.

"Colorless, transparent, rhombic prisms, permanent in the air, odorless or nearly so, having a cooling, saline, somewhat bitter taste, and a neutral reaction. Soluble in five parts of water and in one hundred and thirty-two parts of alcohol at 15° C. (59° F.); in 0.7 part of boiling water and in ten parts of boiling alcohol." (U. S. P.) It should be remembered that the soluble sulphates or diluted sulphuric acid are the chemical antidotes for carbolic acid poisoning, forming sulphocarbolates, which are innoxious. U. S. D. states that this salt is inert.

Sulphocarbolate of sodium is a mild astringent and germicide.

Diseases of the Throat, etc.—Lefferts claims that one-half drachm to eight ounces of water, to which has been added an ounce of glycerin, forms a valuable gargle in RELAXED STATES OF THE THROAT following ACUTE ANGINA. Waring recommends a similar preparation in the treatment of DIPHTHERIA.

SODII SULPHORICINATIS. Sulphoricinate of Sodium.

"A brown, syrupy liquid which readily dissolves in water and alcohol. It forms a good solvent for iodine, iodoform, etc." (Helbing.)

Diseases of the Throat.—This drug has been used by A. Joséas (*La Méd. Moderne*, April 28, 1892) in combination with carbolic acid (eighty grammes of the former to twenty of the latter) for Diphtheria.

SODII HYPOCHLORITIS.

This is a very unstable salt, and consequently is only known in the following solution:—

Liquor Sodæ Chloratæ. Solution of Chlorinated Soda. Liquor Sodæ Chlorinatæ. (Pharm. 1870.) Labarraque's Solution.

"A clear, pale-greenish liquid, of a faint odor of chlorine, a disagreeable and alkaline taste, and an alkaline reaction; specific gravity, 1.044. Addition of hydrochloric acid causes an effervescence of chlorine and carbonic acid gas." (U. S. P.) This solution is prepared by double decomposition between solutions of chlorinated lime and sodium carbonate, whereby insoluble calcium carbonate and soluble sodii hypochloritis are formed. The latter is decanted from the precipitate, and should be preserved in well-stopped bottles, protected from the light. Liquor sodæ chloratæ destroys the elastic property of cotton fibre and sponge. The chlorine odor left on the skin after use can be corrected by washing with a lotion of sodii hyposulphis. (*M. B.*, January, 1891, p. 14.) The addition of carbolic acid in any proportion produces a mixture of a peculiar penetrating and, to most persons, disagreeable odor. The best solution is prepared for the market in quart bottles. In a number of specimens of the drug examined by Sternberg, the amount of chlorine varied from 3.80 to 0.03 per cent. Since the properties of the preparation depend upon the amount of chlorine present, it is desirable that the liquid, when prescribed, be freshly made, and the date plainly marked upon the label.

The solution of chlorinated soda is a stimulant, detergent, and a powerful disinfectant and parasiticide.

General Surgery.—As an application to Gangrenous Surfaces, the solution of chlorinated soda may be applied in a strength of one drachm to the ounce of water, or it may be used in full strength in the preparation of a common flaxseed poultice. In the treatment of Aphthous and Phagedenic Ulcerations of the Mouth, which have assumed a sloughing character, the following will be found of service: ℞. Liq. sodii chlorinat., tinct. myrrhæ, āā f℥ss; aquæ rosæ, f℥j; aquæ, f℥vj. The same prescription is of service in Stomatitis of ptyalism, in ulcerated gums of Scurvy, etc. In foul discharges from the vagina, a douche, composed of the solution of one fluid ounce to one pint of water, is efficient.

Diseases of the Skin.—The solution of chlorinated soda has a restricted use in dermatology in affections of the skin, accompanied by profuse suppuration and breaking down of the tissues. It may be added to cataplasms and wet dressings employed to macerate the crusts in PEDICULOSIS CAPITIS and CRUSTED ULCERATIVE SYPHILODERMATA.

Diseases of the Ear, Nose, and Throat.—The solution of chlorinated soda is one of the most valuable agents in our possession for the correction of fetor in the ear, nose, and throat. It may be employed in the strength of fifteen to twenty drops to the ounce as a lotion, gargle, or spray. It is useful, when largely diluted, to kill LARVÆ of insects which have invaded the external auditory meatus. (Roosa.) It is especially indicated in OZÆNA and "PHARYNGITIS SICCA." It is also of value in conditions accompanied by sloughing, such as are met with in NOMA and the ANGINA of SCARLET FEVER, since, in addition to the disinfectant properties, it acts as a solvent to the sloughing masses. With care a strength as great as two drachms to the ounce can be borne in FETID CORYZA. Should a stronger preparation be demanded, as in the treatment of DIPHTHERIA, it is best to apply it as pigment.

Diseases of the Eye.—The solution of chlorinated soda has been highly recommended as an antiseptic application to the eye in the proportion of one part to seven or ten of water. In the former strength it is applied, on pledgets of cotton, directly to the everted lids or to SLOUGHING ULCERS OF THE CORNEA; for using freely as a wash, the weaker solutions may be still further diluted. It has not been extensively used.

SOZOIODOL AND ITS COMPOUNDS.

"Sozoiodol is a compound of iodine with paraphenol-sulphonic acid, which only differs from sozolic acid, or orthophenol sulphonic acid, in the position of the hydroxyl and sulphonic group." (T. Lauder Brunton, "Modern Therapeutics," 1892.) Sozoidol contains three of the strongest antiseptics: iodine, sulphur, and carbolic acid. It forms salts of mercury, potassium, sodium, and zinc. These appear to be pure and non-irritating. Sozoiodol has not been thoroughly studied, and its properties not always separately treated from the bases with which it unites. It resembles iodoform in many respects, but is without odor. It is non-toxic.

Sozoiodol is described as being astringent, germicidal, and disinfectant.

According to Suchannek (*Correspondbl. für schweizer Aertze*, XIX, 1889, 283), a two per cent. solution of sozoiodol arrests the development of pyogenic coccii in gelatin.

General Surgery.—Sozoiodol may be applied in powder, either pure or mixed with talc, combined with lanolin (1–10), or in solution (two grains and upward). It may be used as an adjuvant to a protectant dressing of cotton. In open wounds which have become putrescent, sozoiodol possesses advantage over other agents. E. Ostermeyer (*Deutsch. med. Wochenschr.*, October 10, 1889) uses sozoiodol in the treatment of BURNS. This writer claims that it possesses advantages over iodoform. It is slightly analgesic, and prevents suppuration. The vesicles are punctured, and a mixture of sozoiodol and starch (1–10) dusted over the exposed surfaces. The favorable action of the remedy can be detected within twenty-four hours. Sozoiodol is also used in the treatment of INDOLENT ULCERS. In two cases presenting identical features, Nitschmann (*Int. klin. Rundschau*, No. 32, 1891; see also *Therap. Gaz.*, February, 1889) treated one with iodoform and the other with sozoiodol, and found the latter the more efficient agent. The formula commended by this writer is as follows: Ten parts of sozoiodol to one of lanolin.

Diseases of the Nose, Throat, etc.—Sozoiodol, according to M. A. Fritsche (*Therapeut. Monatsheft.*, June, 1888, p. 283). has value in the local treatment of "PHARYNGITIS SICCA" and CHRONIC LARYNGITIS. Claims are also made that it aids in healing TUBERCULAR ULCERATIONS.

Suchannek recommends it in the treatment of CHRONIC NASAL CATARRH, accompanied with scanty secretions. Insufflations of a powder composed of one part of the salt to seven of talc are preferred. The powder may, however, be weakened and yet retain its efficiency, so as to represent one part to twelve, or even one to fifteen.

HYDRARGYRI SOZOIODOLAS. Sozoiodolate of Mercury.

This salt forms a lemon yellow powder, soluble in water in the proportion of one part to five hundred; more readily soluble than sodium chloride.

Sozoiodolate of mercury, in the strength of 1–10, is said to be caustic.

General Surgery.—Troemner credits it with value in the local treatment of SYPHILIS. H. Suchannek recommends it in proportion of 1–20 and 1–10 for SYPHILITIC ULCERATION; it is to be applied directly by a dossil of cotton to the selected surface.

Diseases of the Skin.—Nitschmann (*Wien klin. Wochenschr.*, 1891, No. 26) used a ten per cent. solution of the sozoiodolate of mercury as a lotion in TINEA VERSICOLOR, and also in hypodermic injection for SYPHILITIC ERUPTIONS. The formula he employs is the following: ℞. Hydrarg. sozoiodol., gr. viij; potas. iodid., gr. xvj; aquæ destillat., ♏c. M. A "Pravaz syringeful" (♏xv) of this is injected once a week.

Diseases of the Throat, etc.—Suchannek commends this salt in the local treatment of TUBERCULAR LARYNGITIS.

POTASSIUM SOZOIODOL. Sozoiodolate of Potassium.

This salt of sozoiodol occurs in long, white, acicular crystals, soluble in fifty parts of water. The solution is acid to litmus paper, and gives a bluish violet color with ferric chloride. Exposure to light causes the aqueous solution to darken.

Diseases of the Nose, etc.—H. Suchannek (*Correspondenz-Blatt f. schw. Aertze*, 1889, XIX, 283) claims that this salt combined in equal proportions with talc, or one of the salt to two of talc, possesses distinct advantages over other astringent and alterative powders in the treatment of CHRONIC NASAL CATARRH.

SODII SOZOIODOLAS. Sozoiodolate of Sodium.

The sodium salt of sozoiodol occurs in white, well-defined, prismatic crystals. These crystals are soluble in fourteen parts of water. The solution darkens on exposure to light, has an acid reaction, and gives a violet color with ferric chloride. This salt is more adhesive and more soluble than the sozoiodolate of potassium.

Sodium sozoiodolate is astringent and alterative.

Diseases of the Nose, etc.—In proportions of one part of the salt to two of talc, H. Suchannek (*loc. cit.*) extols a powder, to be insufflated in the treatment of CHRONIC NASAL CATARRH, associated with muco-purulent or purulent discharges.

ZINCI SOZOIODOLAS. Sozoiodolate of Zinc.

Zinc sozoiodalate forms colorless, acicular crystals, with six molecules of water. The salt is soluble in twenty parts of water, and in alcohol.

Sozoiodolate of zinc is stimulant and astringent.

General Surgery.—In GONORRHŒAL URETHRITIS sozoiodolate of zinc is recommended. It is indicated in VAGINITIS when daily treatment is impossible. A tampon saturated with the ointment (1-10) is an available form. Satisfactory results have been obtained by the use of the powder in cases of CATARRH of the UTERINE CERVIX.

Diseases of the Skin.—Schwimmer has used the zinc preparation in simple ULCERS.

Diseases of the Throat, etc.—A writer in the *L'Union Méd.*, 1890, recommends sozoiodol of zinc one part, talc ten parts, as a snuff for ATROPHIC RHINITIS. Suchannek also commends this salt in HYPERTROPHIC CHRONIC NASAL CATARRH accompanied with diminished secretion, and as an excitant in ATROPHIC RHINITIS, and "PHARYNGITIS SICCA." The salt possesses the additional characteristic that in connection with excitement of the nasal mucous membrane it softens crusts and diminishes fetor. In the same combination, in the proportion of one of the salt to twelve of the talc, in HYPERTROPHIC NASAL CATARRH. In the proportion of one to twenty it may be employed locally in SYPHILITIC ULCERATION OF THE NOSE AND PHARYNX.

SPIRITUS ÆTHERIS NITROSI. Spirit of Nitrous Ether. Sweet Spirits of Nitre.

"An alcoholic solution of *ethyl nitrite*, containing five per cent. of the crude ether." (U. S. P.)

Sweet spirit of nitre is refrigerant and parasiticide.

Diseases of the Skin.—The Spiritus Ætheris Nitrosi is employed as an application in Dermatitis Venenatis. A rag or sponge wet with the ether, applied to the pubis and covered with oiled silk, kills Pediculi Pubis at once.

SPIRITUS ODORATUS. Perfumed Spirit. Cologne Water.

A Cologne water is official (U. S. P.), but the formulæ of the best apothecaries are more popular. One of these, which yields a product practically indistinguishable from the celebrated "Farina Colognes," is as follows:—

Take of oil of bergamot,	400 ♏.
" lemon,	400 ♏,
" orange,	400 ♏.
" lavender,	48 ♏.
" rosemary,	96 ♏.
" neroli (bigarade),	144 ♏.
" neroli petite grain,	192 ♏.
extract of orange flowers,	800 ♏.
" jessamine,	200 ♏.
oil of verbena,	24 ♏.

Alcohol sufficient to make one gallon.

All the ingredients must be of the best. The alcohol is to be absolutely without odor. That which is known in commerce as "Cologne spirit" is best adapted to this purpose.

General Surgery.—Cologne water is frequently employed in domestic medicine as a lotion for Bruises or Contusions. It is a useful preparation (though to many persons the constant odor left after using it becomes disagreeable) to apply as a liniment after the removal of surgical dressings in the same way in which whisky or alcohol is employed. It is soothing in Headache, applied to the temples and allowed to evaporate.

Diseases of the Mouth, Throat, etc.—A few drops of Cologne water may be added to medicated fluids to be inhaled. It is an agreeable addition to many gargles.

SPONGIA. Sponge.

For the preparation of sponges for ordinary surgical use the reader is referred to the U. S. D. For bleaching, the method pursued at the Pennsylvania Hospital has been found satisfactory. The sponge, after being thoroughly beaten, to remove all sand and loose matter, is placed in a ten per cent. solution of muriatic acid (f℥ xij–gal. j) for twenty-four hours, afterward to be thoroughly freed from acid by frequent washings.

Then to be placed in a solution of permanganate of potash (℥iiss to the gal.). After a second washing the deeply-stained sponges are placed in a solution of oxalic acid, ʒxxxj to the gallon of water, to which is added sulphuric acid, f℥ss, and allowed to remain until bleached. After again thoroughly washing, they may be packed away dry in clean, stopped glass jars, or kept in a five per cent. solution of carbolic acid. In this way the cheaper grade of sponges may be employed for surgical operations.

General Surgery.—Sponges are of use in surgery in consequence of their softness and the property they possess of absorbing liquids. Sponges are especially valuable in removing the flowing blood from incisions made in operations, since the quick absorption of blood enables the surgeon to see clearly the tissues that are exposed. In abdominal section flat sponges, six to eight inches in diameter, are used as a means of protecting the intestine from the chilling influence of the atmosphere. In the modern method of dressing wounds (especially in hospital practice) absorbent cotton, oakum, tow, etc., largely supplant the employment of sponge. A sponge tent is prepared by taking a piece of conical sponge, and when in a moist state evenly wrapping it with stout thread, thus compressing the mass somewhat into the form of a cylinder; when dry the wrapping is removed and the sponge placed in hot wax. On introduction into a canal (let us say of the cervix uteri) the heat of the body melts the wax and releases the sponge, which by imbibition of moisture causes dilatation of the parts to take place. Sponge tents are inferior to those made from laminaria. In the uterine cavity it is well to introduce at least one sponge tent with the laminaria, as the former will prevent the mass of tents from slipping from the cavity, which so often happens if the agent last named is employed. (See Laminaria.) D. J. Hamilton (*Edin. Med. Journ.*, November, 1881) advocates the introduction of a layer of sponge, which has been rendered thoroughly aseptic, in the treatment of LEG ULCER; he employs the best quality of sponge. The edges are inserted beneath the undermined edges of the lesion, and over this is applied an antiseptic dressing. At first there is evidence of purulent formation, which is followed by granulations passing into the sponge. On the fifth day the edges become firm and the ulcer is occupied with organized material. At the end of three months only small portions of sponge are visible, and by four months all have disappeared. The granulating surface now hastens to cicatrize. A solution of carbolic acid (one to twenty) is used for irrigating the ulcer at each dressing. W. Hall has successfully employed sponge grafts for closing OLD SINUSES. In the opinion of Ferguson every purpose can be accomplished by leaving the sponge in the tract for a few days and then detaching it, so that it is doubtful whether it acts otherwise than as a stimulating dressing.

Diseases of the Nose.—Sponge may be used to dilate a narrowed nostril, to serve as a tampon against the walls of the chamber in the treatment of FETID CATARRH, and to act as a plug in the posterior nares either for the arrest of bleeding or as a preliminary measure to irrigation. For all these uses the most compact pieces possible of the finest sponge should be selected. The principle of the tampon for the relief of FŒTID CATARRH (see *Gossypium*), which has been discussed by Gottstein, appears to have been practiced by J. Solis-Cohen in the form of sponge compresses.

SPONGIO-PILINE.

Spongio-piline was in use a number of years ago for taking the place of poultices. It consisted of a thick cloth or felt, on the back of which was a layer of rubber, and on the face a layer of sponge. This sponge was felted in and then shredded, so as to make a pile, or nap. The sponge side, when well moistened with hot water, acted as a poultice, the moisture being kept in by the rubber back. It has almost entirely gone out of use, and has disappeared from the stores.

Diseases of the Eye.—Spongio-piline is a convenient means of employing moist heat in ophthalmic practice.

STAPHISAGRIA. Stavesacre.

"The seed of *Delphinium staphisagria*." (U. S. P.) It contains a fixed oil as well as an alkaloid. The oil is efficient but is not available. An ointment, *unguentum staphisagriæ*, is official in Ph. Br. It is made by digesting one part of stavesacre-seed in two parts of benzoinated lard, in a water bath for two hours, and straining.

Stavesacre is parasiticide, while non-toxic to the host.

Diseases of the Skin.—The coarsely-ground seeds of stavesacre, in the proportion of three parts to five of lard, digested for twenty-four hours at a temperature of 212° F. and strained, yield an ointment which is valuable in the destruction of PEDICULOSIS CAPITIS and PEDICULOSIS CORPORIS. It does not, however, kill the ova. The fluid extract, diluted with vinegar, in the proportion of a drachm to the ounce, accomplishes both objects. Stavesacre kills the mature animals and the vinegar the ova. In attacking the head-louse the scalp must be cleansed from time to time, during the treatment. No parasiticide is effective in destroying the body-louse unless the clothes are subjected to a heat sufficient to destroy the ova.

STRAMONIUM. Jamestown Weed.

Both the leaves and the seeds of *Datura stramonium* are official. The alkaloid (daturine) is obtained usually from the seeds. There are two daturines known, the heavy and the light. The *heavy* daturine is a mixture of atropine and hyoscyamine; and *light* daturine is hyoscyamine. Hence, the alkaloids called daturine are atropine or hyoscyamine, or mixtures of them. (See *Belladonna*.)

Stramonium is one of the ingredients of *baume tranquille*.

[illegible] anodyne and antispasmodic. The over-impression is

[illegible] Surgery.—The leaves of stramonium are applied either in [illegible] cataplasms. In CANCEROUS ULCERATIONS the [illegible] used at the Middlesex Hospital, and is effective in [illegible] made by taking fresh stramonium leaves, one-half [illegible] pounds, mixing the bruised leaves with the lard and [illegible] and straining through lint. The ointment thus [illegible] and applied to the part. In PAINFUL NODES [illegible] leaf, soaked in spirit and laid over the part, [illegible]. An ointmeht composed of equal parts of extract [illegible] Goulard's cerate is a remedy of established value for [illegible]. A small portion is applied twice daily, after ablu- [illegible] ointment of stramonium and of nut-gall may be

[illegible] the Ear and Throat.—Stramonium has held a high [illegible] remedy in SPASMS OF THE GLOTTIS and in ASTHMA. [illegible] the burning leaves may be inhaled. A convenient [illegible] to draw the fumes into the lungs through a pipe filled [illegible] leaves, or a mixture of the same with tobacco. The [illegible] combined with that of nitrate of potassium. The [illegible] carefully watched, since the poisonous properties of [illegible] easily induced. The smoke from about a half ounce of [illegible] inhaled at a single sitting. The number of sittings is [illegible] attendant circumstances. A sensation of heat in the [illegible] the head, or nausea, are indications that a maxi- [illegible] has been obtained. E. L. Shurly (*N. Y. Med. Journal*, [illegible] believes that a solution of the strength of one one- [illegible] of a grain of daturine is of value in the treatment

[illegible] the Eye.—Daturine is a doubtful MYDRIATIC. The [illegible] the shops under that name are probably either identi- [illegible] other alkaloids, a mixture of several of them, or the [illegible] processes.

DATURA TATULA.

[illegible] the Throat, etc.—Similar in properties to those of [illegible] of *Datura tatula*. Fumigation from the leaves [illegible] M. Mackenzie for SPASM OF THE GLOTTIS.

STROPHANTHUS.

The seed of *Strophanthus hispidus*. The kombe arrow poison is made from this seed. Strophanthin is the active glucoside. "It is a white, crystalline powder, neutral in reaction, intensely bitter, freely soluble in water, less so in rectified spirit, and nearly insoluble in ether and chloroform." (U. S. D.)

Strophanthus is analgesic.

Diseases of the Eye.—Numerous experiments on animals have shown that strophanthin produces an anæsthetic effect upon the cornea. Various observers have reported different results of experiments on the human eye, but all agree that the drug is too irritating to be introduced into practice.

STYRONE. Storone.

Styrone occurs in balsam of Peru and in storax; it is presented in two forms, crystal and liquid, both having the same virtue, the crystals being the more expensive. Styrone has an agreeable odor, somewhat like that of frankincense, and is non-poisonous. It is somewhat soluble in water, and freely soluble in alcohol and ether. H. H. A. Beach (*Boston Med. and Surg. Jour.*, August 1, 1889) has called special attention to this agent.

Styrone is antiseptic and analgesic.

General Surgery.—For disinfecting FOUL or ULCERATING SURFACES a solution of 1–12 has given satisfaction. After excision of the mammary gland in the female, the wound healed in ten days, under a dressing of charpie soaked in the solution last named. (Beach.) The same writer used styrone successfully in PYOTHORAX. After resection of a rib the cavity was at first flushed with a 1–200 solution, the strength being gradually raised to 1–40. When used as a spray styrone is of service in cases of ulcerating CANCEROUS GROWTHS. An emulsion, with olive oil, water, or liquid vaseline, may be freely applied to WOUNDS if the undiluted drug is irritating.

Diseases of the Ear.—According to Cheltsoff (*Bolinitchnaya gazeta, Botinka*, May 9, 1890) styrone is of value in the treatment of OTORRHŒA. A scruple is added to an ounce of alcohol. One part of this mixture is diluted with seventy of water and injected. The remedy acts rapidly in promoting cure in cases in which bichloride of mercury and alcohol have failed.

SULPHUR.

Three forms of sulphur are official. Sulphur Sublimatum (sublimed sulphur), which "is sulphur prepared from crude or rough sulphur by sublimation" (Ph. Br.); Sulphur Lotum (washed sulphur); and Sulphur Præcipitatum. Precipitated sulphur is "a very fine, yellowish-white, amorphous powder, odorless and almost tasteless, insoluble in water or in alcohol, but completely soluble in a boiling solution of soda, or in disulphide of carbon." (U. S. P.) The same description applies to sulphur lotum, except that it is said to be of a citron yellow, and, with the same exception, and the additional one that it has a slight odor and taste, to sulphur sublimatum. An ointment of sulphur (thirty parts to seventy parts of benzoinated lard) is official. (See *Thalinin.*)

Sulphur is, first, an antiseptic and parasiticide, and, second, a keratoplastic agent, favoring the reproduction of the horny epithelium. It acts also as a vehicle in the composition of powders. It possibly possesses obscurely defined alterative properties.

General Surgery.—Sulphur has been employed in the treatment of SCIATICA by Cowden. In a patient treated by this writer, where one-half grain doses of morphine, combined with one-sixtieth of a grain of atropia, failed to give relief, the affected limb was covered with precipitated sulphur, and in a short time profuse sweating occurred, with marked diminution of pain. The treatment was repeated for two nights. A second patient, who otherwise could not move in bed, was cured. Duchane (*Therapeutic Gazette*, 1888, p. 626) also reports success with this treatment. The odor of the urine partook strongly of sulphuretted hydrogen.

Diseases of the Skin.—Sulphur is one of the oldest and best known remedies used in the external treatment of diseases of the skin.

As a parasiticide its effect upon SCABIES is well known. A few thorough inunctions of the Unguentum Sulphuris (U. S. P.) will, in most cases, suffice to arrest the disease, so far as the parasite is concerned. There remains, however, to be treated, the ECZEMA, or DERMATITIS, rather, which accompanies the disease. This is rather aggravated than allayed by the use of strong sulphur ointment, so that the treatment of such cases is often unduly prolonged, unless the sulphur ointment is suspended. For this reason a milder sulphur ointment is preferable, and in most cases this should be combined with some agent which, while in itself parasiticide, will also cure the dermatitis. Such a combination is found in the ointment of naphthol and sulphur. The following combination is recommended by J. C. White, of Boston: ℞. Flor. sulphuris, ʒij; β-naphthol, ʒj; bals. Peru, vaseline, āā ℥j. M. (See "*Naphthol.*")

In Germany, "*Helmerich's Ointment*" has been largely used. This is composed as follows: ℞. Sulphuris, ʒij; potas. carb., ʒj; adipis, ℥j. M.

Vlemingckx's Solution (see below) is sometimes employed in SCABIES.

In this country an ointment of one drachm of the flowers of sulphur to the ounce of lard will generally be found strong enough.

In the treatment of the vegetable parasitic diseases, especially TINEA VERSICOLOR, sulphur may be employed with success. The form of *Vlemingckx's Solution* is most convenient for this purpose. This is composed as follows: ℞. Calcis vivæ, ʒj; sulphuris sublimat., ʒiss; aquæ, fʒxiij. M. The lime, first slacked, is thoroughly mixed with the sulphur and the mixture is then heated with the water, thoroughly stirring until incorporated. The whole mixture is then boiled down to one fluidounce and filtered. Usually it should be considerably diluted, as it is almost caustic when made by the above formula. Vlemingckx's solution is sometimes employed in the local treatment of Psoriasis, a small portion of the lotion, more or less diluted, being well rubbed into the patches daily.

In the treatment of Comedo the following combination has been found useful: ℞. Sulphuris, glycerini, potas. carbonat., alcoholis, ætheris, āā p. æq. M. The parts are taken by weight. The mixture is to be well rubbed into the part with friction.

Sulphur forms a prominent element in the preparations employed in the treatment of Acne. In the form of ointment alone, or combined with camphor, this drug is useful. The following formula is an example: ℞. Sulphur præcipitat., ʒss; pulv. camphoræ, gr. x; ung. aquæ rosæ, ℥j. M. A somewhat similar preparation, in the form of a lotion, is the following: ℞. Sulphur præcipitat., gr. xxx ad. ʒj; pulv. camphoræ, gr. xv; alcoholis, fʒij; aquæ, ad. f℥j. M. An excellent wash in many forms of Acne is that known as "Kummerfeld's Lotion": ℞. Sulphur præcipitat., ʒij ad. iv; pulv. camphoræ, gr. x ad. xx; pulv. tragacanth., ℈j ad. iiss; aquæ calcis, aquæ rosæ., āā f℥ij. M.

In Psoriasis, sulphur is employed in combination with tar in the preparation known as "*Wilkinson's Ointment*:" ℞. Sulphur præcipitat., picis liquidæ, āā gr. lxvj; pulv. cretæ preparat., gr. xliv; saponis viridis, adipis, āā ℥ss. M. This ointment is also useful in Tinea Tonsurans and in some cases of Infiltrated Eczema. It is a favorite European remedy for Scabies.

Sulphur soaps are of more value than most medicated soaps, though their effect is feeble compared to that of other vehicles of administration. (See *Sapo.*)

Even before the knowledge that so many inflammatory and particularly pustular diseases of the skin were dependent upon bacteria was established, it had been found that sulphur was of value in these affections. We therefore find it employed in Eczema, Sycosis, Impetigo, Ecthyma, and similar affections with success. Ointments of one-half to two drachms to the ounce are usually valuable in these diseases. In the Eczema of Children a sulphur and tar ointment, half a drachm of each to the ounce of oxide of zinc ointment, is of high value.

Diseases of the Nose and Throat.—Flowers of sulphur act the part of an indifferent substance in the composition of a powder to be used by insufflation in the nasal chambers. E. J. Moure recommends a similar powder in the treatment of "Pharyngitis Sicca." It is also much employed in the south of Europe as a domestic medicine, as a local remedy in DIPHTHERIA. A lozenge is offered for same, which contains two grains of sulphur to the mass.

OLEUM LINI SULPHURATUM. Sulphur Balsam.

This preparation is made by boiling sulphur with linseed oil.

Sulphur balsam is an old form of securing the local effect of sulphur upon the tissues.

SULPHURIS HYPOCHLORITUM. Hypochloride of Sulphur.

Sulphur hypochloride is a mixture of sulphur chloride and sulphur. Sulphur chloride is prepared by passing dry chlorine over dry sulphur.

Diseases of the Skin.—Hypochloride of sulphur, two drachms, combined with carbonate of potassium, ten grains; lard, one ounce, and oil of bitter almond, ten drops, has been employed in the treatment of ACNE.

SULPHURIS IODIDUM. Iodide of Sulphur.

"Iodide of sulphur is a grayish-black solid, generally in pieces having a radiated, crystalline appearance, the characteristic odor of iodine, a somewhat acrid taste, and a faintly acid reaction. It is insoluble in water, but very soluble in disulphide of carbon; also soluble in about sixty parts of glycerin. Alcohol and ether dissolve out all the iodine, leaving the sulphur. When exposed to the air it gradually loses iodine." (U. S. D.)

Iodide of sulphur is alterative.

Diseases of the Skin.—Iodide of sulphur enters into the composition of an ointment sometimes employed in the treatment of ACNE. Ten grains to a drachm are incorporated with an ounce of lard.

SUMBUL. Sumbul. Musk Root.

"The root of *Ferula sumbul*." (U. S. P.) It contains two volatile oils, two balsamic resins, angelic and valerianic acids. The single official preparation is the tincture, which contains the activity of ten parts of sumbul in one hundred parts of alcohol.

Sumbul is a nervous stimulant and antispasmodic.

Diseases of the Throat, etc.—Sumbul is employed by M. Mackenzie in the form of the tincture. One drachm is added to nine of rectified spirits; nitrate of potassium paper (q. v.) is moistened therewith. It mitigates the irritative effects of the inhalation of the fumes of the burning paper in the treatment of SPASM OF THE LARYNX, TRACHEA, AND BRONCHIAL TUBES.

TABACUM. Tobacco.

"The commercial dried leaves of *Nicotiana tabacum.* Linné." (U. S. P.) Tobacco relaxes muscular tension, and thus aids in those clinical conditions in which muscle fibres cannot be relaxed by the will. Ether and chloroform have largely taken its place.

Tobacco holds a secondary position as an antispasmodic, sedative, sternutatory, and excipient. In the local use of tobacco care must be taken to avoid the easily induced toxic impression.

General Surgery.—An infusion of tobacco is recommended for the relief of PRURITUS VULVÆ and PRURITUS ANI. It has also been used in the form of an ointment in painful HEMORRHOIDS. Tobacco stupes or enemata are aids in the reduction of HERNIA. Deaths have resulted from the use of tobacco enemata for SEAT WORMS.

Diseases of the Nose, etc.—Tobacco is one of the ingredients of *Dobell's snuff.* Formerly tobacco was of good repute in the treatment of CHRONIC CATARRH, but it is now little used. It occasionally aids the impression of stramonium in the treatment of SPASMODIC ASTHMA, or it may be substituted for this drug. Its action is irregular and often disappoints. Puffing tobacco smoke into the external auditory passage is an old domestic remedy for OTALGIA.

TALCUM. Talc. French Chalk. Tailor's Chalk. Venetian Talc.

A magnesium silicate; an insoluble, inert, and incombustible powder. The National Formulary gives a recipe for its purification to fit it for use as a filtering medium. Powdered talc is largely used as a face-powder, either alone or combined with other cosmetics.

Talc is protectant and excipient.

Diseases of the Ear and Nose.—Talc is often used in INFLAMMATION OF THE EXTERNAL AUDITORY MEATUS. Diluted with bismuth subnitrate it forms the basis of a snuff for FETID CATARRH. (Trousseau.)

TERRA. Earth.

Earth, when relatively free from organic matter and prepared by being passed through a fine sieve, acts the part of a mild protectant and disinfectant. A. Hewson ("Earth as a Topical Application in Surgery," Philadelphia, 1872) employed powdered earth for a variety of purposes in general surgery.

Mud has long been in popular repute as a vulnerary and as a protectant application to swellings resulting from the stings of insects.

TEREBINTHINA. Turpentine.

"A concrete oleoresin from *Pinus australis*, Michaux, and from other species of Pinus. * * * In yellowish, tough masses, brittle in the cold, crummy-crystalline in the interior, of a terebinthinate odor and taste." (U. S. P.)

The subjects treated of in this place are the following: Resina; Emplastrum resinæ; Oleum terebinthinæ; Terebene; and Terpinol.

RESINA. Resin. Colophony. Rosin.

"The residue left after distilling off the volatile oil from turpentine. A transparent, amber-colored substance, hard, brittle, with a glossy, shallow, conchoidal fracture, and having a faintly-terebinthinate odor and taste. It is soluble in alcohol, ether, and fixed or volatile oils." (U. S. P.)

The *ceratum resinæ* (containing thirty-five parts of resin, fifteen parts of yellow wax, and fifty parts of lard) is official, as is the *emplastrum resinæ*, which contains fourteen parts of resin in eighty parts of lead plaster mixed with six parts of yellow wax. (See *Carbolized Gauze.*)

General Surgery.—Resin is not employed in surgery in the pure state, although in conjunction with other substances it forms the basis of plasters, chief among which is the adhesive, or resin plaster. The resin cerate is one of the best dressings for INDOLENT GRANULATIONS, especially those following BURNS and SCALDS. It is frequently employed as an early dressing to BLISTERED SURFACES to prevent their healing. The compound resin cerate or "*Deshler's Salve*," as it is commonly known, is a more stimulating ointment. Both of the resin cerates are extensively employed as dressings for FURUNCULUS INFLAMMATION.

Diseases of the Throat, etc.—M. Mackenzie uses a resinous solution in ether, one to five, as a varnish on DIPHTHERITIC DEPOSITS; the membrane should be first dried with blotting paper.

EMPLASTRUM RESINÆ. Resin Plaster. Adhesive Plaster.

This is the *lead adhesive plaster* which was universally used before the introduction of the rubber adhesive plaster, and which, because it is less irritating to sensitive skins, is still preferred by some practitioners. It is made by adding to eighty parts of lead plaster fourteen parts of resin and six parts of yellow wax. It is then spread on a muslin prepared for the purpose.

Adhesive plaster, while based upon the lead plaster, is rarely, if ever, used for the purposes of exhibiting the impression of oxide of lead, and is therefore here included under the head of terebinthina, since the resin which enters into its composition also gives the preparation its official name.

General Surgery.—To obtain the best results from adhesive plaster, the material must be freshly cut from a roll which has been kept in a tin box or other close-fitting receptacle. The plaster is best heated over an alcohol lamp or against the side of a vessel containing hot water (the smooth or non-adhesive side being placed in contact with the heated surface until the plaster is thoroughly softened), when it must be immediately applied to the skin. Placing a strip of adhesive plaster around a stovepipe, with the adhesive side out, will often prove practicable in private practice. When strips are used which from their great length it is inconvenient to heat, the plaster surface can be softened by rubbing it over with a bit of raw cotton moistened with chloroform or ether.

Adhesive plaster may be worn for weeks at a time without producing cutaneous irritation. Hence it is to be preferred to rubber plaster for making extension for fracture of the thigh, or for affections of the hip joint. Firmly applied over an ULCER and supported by a bandage, it forms a reliable method of dealing with LEG ULCERS due to varicose veins. Adhesive plaster is extensively employed in the treatment of fractured ribs and contusions of the chest. A number of strips about two inches wide are applied parallel to the ribs, beginning at the lowest and passing up to the axilla. Each strip is to be applied with firm traction, and extend from the vertebral column to a point a little beyond the median line in front. Marked relief is afforded by this procedure. In fracture of the clavicle in children a dressing of adhesive plaster will be found a satisfactory means of keeping the ends of the bone in position.

Sayres' dressing for fractured clavicle is made from adhesive plaster.

OLEUM TEREBINTHINÆ. Oil of Turpentine.

"A volatile oil distilled from turpentine." (U. S. P.) It enters into the composition of *St. John Long's Liniment.*

Oil of turpentine is rubefacient, counter-irritant, antiseptic, hæmostatic, and aids in diminishing mucous secretion. Rossbach (*Berlin klin. Wochenschr.*, No. 20, May 15, 1882) found that a two per cent. solution of the oil applied to a mucous surface tended to relieve determination of blood. When applied to the skin, evaporation being prevented, oil of turpentine is an irritant, causing redness and smarting, which will, if unchecked, induce sloughing. It is much employed as a counter-irritant, especially when a large surface is to be acted upon. When a decided impression is demanded cantharides will be found preferable. It is the opinion of some observers that it possesses antiseptic properties, but this is not confirmed by the experiments of Koch.

Oil of turpentine is a powerful deodorant of iodoform.

General Surgery.—Oil of turpentine forms the basis of an efficient stupe, which may be applied in one of the following ways: (1) A piece of flannel is wrung out of boiling water and liberally sprinkled with the oil, then applied to the affected part and allowed to remain from five to twenty minutes, according to the sensitiveness of the skin. If not skilfully prepared there is danger of either chilling or scalding the patient. (2) a vessel containing the oil is placed in hot water; a piece of flannel, wrung from the oil, is then applied to the skin. A turpentine stupe is of service in BRONCHITIS. It is also valuable in relieving CONGESTION OF THE LUNGS following tracheotomy. No counter-irritant offers a prospect of usefulness in PERITONITIS equal to that obtained by frequently applied stupes, immediately followed by large, hot flaxseed poultices. An excellent laxative enema is composed as follows: Oil of turpentine, one ounce; olive oil, two ounces; hot soapsuds, one pint. The oil renders the mass more active than it would otherwise be.

R. Hargis (*Med. News*, March 3, 1888) extols oil of turpentine as a dressing for LACERATED WOUNDS and CONTUSIONS. Pledgets of cotton or lint are placed on in position and retained by a bandage. The second dressing consists of one part of the oil and two parts of linseed oil, applied in a way similar to the above.

Since oil of turpentine readily removes remnants of old ointments, plasters, etc., it is often resorted to as a means of preparing the skin for the incisions of surgical operations. After the part has been rubbed with cotton saturated with the agent, it should be washed with soap and water. In the after-treatment of fracture, when the extension apparatus has been removed, a small amount of the oil rubbed on the skin will dissolve particles of plaster, etc.

Diseases of the Skin.—Oil of turpentine is occasionally used as a stimulant in ALOPECIA AREATA, when it is diluted with one of the bland oils, and also in PSORIASIS. In neither of these affections, however, has it gained general approbation. It has also been employed in the treatment of TINEA TONSURANS. It is employed pure, but with some caution, on account of its strongly stimulating properties.

Diseases of the Ear, Throat, etc.—Diluted with almond oil, or olive oil, oil of turpentine is used as an injection in the treatment of caries. Cecchini (*Annals Univ. di Med. e Chir.*, August, 1885; *Centralbl. f. Chirurg.*, 1886, p. 2) claims that it is of special value in the treatment of CARIES of the TEMPORAL BONE. Applications should be made every three or four days. As the carious process ceases, the oil of turpentine should be substituted by solutions of boric acid. M. Mackenzie uses equal parts of oil of turpentine and glycerin in the treatment of APHTHÆ. In DIPHTHERIA it has long been a favorite preparation with some practitioners. M. Lewentaner (*Centralblatt für klin. Medicin*, 1887, No. 3), Lunin, J. Lewis Smith (*N. Y. Co. Med. Assn.*, 1887) may be mentioned in this connection. In the form of a gargle Erichsen ("System of Surgery," p. 719) uses oil of turpentine suspended in mucilage for HEMORRHAGE after excision of the TONSILS. Under its property of diminishing secretion, oil of turpentine used as a pigment in LARYNGITIS, which is accompanied by excessive secretion, is highly commended by M. Mackenzie. The vapor diffused through the apartment in which the patient is confined is a favorite means of J. Solis-Cohen for arresting COUGH and giving rest to ACUTE CATARRHAL INVASION OF THE LARYNX. Or a mixture of coal tar and turpentine may be burnt in the apartment in which the patient is and the fumes inhaled in DIPHTHERIA. The oil may be sprinkled about the carpet, under the bed, or on the clothing. It is also of value in CHRONIC INFLAMMATION OF THE LOWER RESPIRATORY TRACT, and has been used in localized diseases in the larynx, trachea, and bronchi, and even in the lung itself. The dose is five minims of the oil to a pint of water at 150° F., taken by inhalation. Brondel (*Gaz. des Hôpitaux*, December 11, 1866) recommends oil of turpentine for treatment in the latter stages of DIPHTHERIA, after the membranes have been removed. Oleum terebinthinæ, on being inhaled, causes the lungs to become pale, due to constriction of the pulmonary vessels (A. Israi), and is thus indicated in HYPERÆMIA and HYPERSECRETION.

TEREBENE.

Terebene is produced by treating oil of turpentine with sulphuric acid. It separates as an oily layer; is purified from the acid by being passed through carbonate of lime, and rectified by distillation. It boils, according to different authorities, at from 156° to 180° C. It is insoluble in water, and is best prescribed in emulsion.

Terebene, according to Murrell (*British Med. Jour.*, July 24, 1884), is antiseptic and germicide, 1–450 being capable of keeping in check the growth of the yeast plant.

General Surgery.—Bertin extols the advantages of terebene mixed with equal parts of olive oil, or oil of almonds (as employed by Vaucher, of Geneva), in the treatment of CANCER OF THE UTERUS. It is applied by means of small cotton tampons saturated with the agent and left in contact with the diseased surfaces for several days. It should then be removed. After the use of a detergent douche the agent is reapplied.

Diseases of the Throat, etc.—Terebene is used as an inhalant in chronic affections of the lower respiratory passages when a stimulating and antiseptic effect is desired. Twenty drops from a napkin may be inhaled daily. It is especially adapted to chronic irritative WINTER BRONCHIAL COUGH, which is free from complication. In like manner it tends to allay the cough of LARYNGEAL PHTHISIS. From five to forty minims of terebene may be added to an ounce of water in the presence of twenty grains of magnesium carbonate. A teaspoonful is mixed with a pint of water and inhaled at 140° F. for ten minutes night and morning. (Lefferts.) W. W. Hardwicke (*Lancet*, November 2, 1889) advises combining terebene with oil of eucalyptus and alcohol as a spray in WHOOPING COUGH.

TERPINOL AND TERPIN-HYDRATE.

"When turpentine oil is left in contact with concentrated hydrochloric acid a dihydrochloride is formed ($C_{10}H_{16}2HCl$). This forms rhombic plates insoluble in water and decomposed by boiling with alcoholic potash with formation of *terpinol* $(C_{10}H_{16})_2H_2O$." (U. S. D.) It is an agreeable, aromatic liquid, insoluble in water, and is best administered in emulsion.

Terpin-hydrate and terpine are other chemical products of terebinthina and possess similar medicinal properties.

Diseases of the Throat.—Terpin-hydrate is believed to have a specific effect on the bronchial mucous membrane, and thus to be adapted for use as an inhalant in CHRONIC TRACHEITIS and CHRONIC BRONCHITIS. Terpinol in the proportion of two minims to the ounce of water may be used as a cleansing gargle. Terpin-hydrate in the proportion of five minims to each mass is used in the form of a lozenge.

THILANIN. Brown Sulphurated Lanolin.

Thilanin is the name given a substance which represents the reaction of sulphur on lanolin. It is a commercial preparation. It is alleged to contain three per cent. of sulphur. It has been introduced as a substitute for boric-lanolin and boric-vaseline. It is a yellowish brown unctuous substance of the consistence of lanolin, containing three per cent. of sulphur. (M. B., February, 1892, p. 116.)

Diseases of the Skin.—Thilanin has been used with success in ACUTE ECZEMA OF THE FACE and eczema of children. In SYCOSIS also thilanin has been employed with advantage. Also in ACNE ROSACEA and DERMATITIS, caused by chysarobin. In other cases it has failed, and it must be said to be still upon trial.

THIOL.

Thiol is prepared by heating the brown-colored paraffin oils, having a specific gravity of 0.890 to 0.900, with sulphur at 215° C. The sulphur combines with the unsaturated hydrocarbons only, and the resulting compounds, by means of suitable solvents, are removed and treated at a low temperature with concentrated sulphuric acid, which converts them into compounds soluble in water. By further cooling thiol separates out, and after removal is evaporated *in vacuo* to a syrupy consistence, or to a dry powder.

The liquid thiol should be of such concentration as to contain about forty per cent. of the dry powder, when it will have a specific gravity of 1.082 at 15° C.

Thiol is miscible with water or glycerin, but only partly dissolved by alcohol or ether. In many respects it resembles ichthyol, but is not known to be identical with it. It is free from the disagreeable odor of ichthyol.

The solid thiol occurs either in dry powder or in scales. The addition of a little glycerin to water aids in the solution of this solid substance.

Thiol is antiseptic and protectant.

General Surgery.—Thiol has been used in RHEUMATIC ARTHRITIS and other affections of rheumatic nature, as well as for CONTUSIONS, BURNS, SCALDS, ERYSIPELAS, FROSTBITE, ULCERS, etc. The following ointment constitutes a convenient form for its exhibition: Thiol and vaseline, each one drachm; lanolin, one ounce; or it may be used as a powder, viz.: thiol sicc., one drachm; zinci oxid., two drachms; amylum, one ounce; talc, two ounces.

Gottschalk (*Centralblatt f. Gynækologie*, March 21, 1891) has used thiol in the treatment of ENDOMETRITIS, PERIMETRITIS, and VAGINITIS with success, his method being to place tampons saturated with a ten or twenty per cent. glycerin solution of the drug within the vagina, at the same time anointing the abdomen with an ointment of similar strength.

Diseases of the Skin.—Schwimmer (*Wien klin. Wochens.*, 1890, No. 18) employs the semi-fluid form of the drug suspended in water in the proportion of one to three in HERPES ZOSTER, PAPULAR ECZEMA, and DERMATITIS HERPETIFORMIS. He also finds the dry powdered thiol useful as an application in ERYTHEMA MULTIFORME.

In DERMATITIS HERPETIFORMIS the ruptured vesicles were painted twice daily by means of a brush with the suspension of thiol (one to three). The fluid dried completely in a few minutes. Repeated layers of the paint were laid on for several days, resulting in marked diminution of the burning and itching. When washed off, the vesicles had dried up and pigmentation only remained.

In ERYTHEMA MULTIFORME the lesions were first painted with the suspension of thiol and then dressed with the pure powder.

In several cases of moderate ACNE and ACNE ROSACEA when the disease was limited it yielded to thiol under Schwimmer's observation in a few weeks. In similar cases treated by others little or no benefit was gained.

In MOIST ECZEMA RUBRUM Schwimmer gained much benefit by the use of an ointment of one part of liquid thiol to ten of lard.

The chief advantage which thiol has over ichthyol is that it is odorless, but so far as our experience with this remedy goes it is inferior in value to ichthyol.

THIORESORCIN.

Diseases of the Skin.—Thioresorcin has been employed as a substitute for iodoform. Being non-poisonous and without smell it should have some advantages over the latter drug. It is employed as a dusting powder and as an ointment made with vaseline to the strength of fifty to one hundred grains to the ounce in ECZEMA, PSORIASIS, and SCABIES.

THUJA. Arbor Vitæ.

"The fresh tops of *Thuja occidentalis.* Linn." (U. S. P.) The white cedar of North America. A tincture and an essential oil are procurable.

Arbor vitæ is excitant and absorbent.

General Surgery.—The fresh leaves of arbor vitæ used as a poultice is a domestic remedy of alleged value in INDOLENT ULCERATIONS. Piffard commends a tincture in the treatment of GLEET.

Diseases of the Skin.—This drug has been used successfully in the treatment of PAPILLOMATOUS GROWTHS (*verrucæ* and *condylomata*). A few drops of the tincture given internally thrice daily and a compress wet with the tincture outwardly applied have removed VENEREAL WARTS which have resisted the usual treatment. Having employed this drug successfully in several cases by external use alone we consider it worthy of further trial.

Diseases of the Throat, etc.—The essential oil of arbor vitæ is employed by S. Hartwell Chapman in the proportion of a few drops to a pint of water in the temperature of 140° as an inhalation in ACUTE PHARYNGITIS; it may be combined with the familiar inhalant benzoin, to which a little infusion of hops has been added. E. L. Shurly (*N. Y. Med. Jour.*, September 11, 1886) finds that a spray of the fluid extract is useful in shrinking INTRALARYNGEAL PAPILLOMATA. It should be applied twice daily for several months.

THYMOL. Thymic Acid.

Thymol is a stearoptene obtained by a refrigeration or other process from the volatile oil of thyme and some other volatile oils. It has the appearance of moist granular camphor; it is scarcely soluble in water, very soluble in alcohol, also in ether, benzin, benzol, chloroform, and in the fixed and volatile oils. When mixed with camphor it liquefies.

Thymol is antiseptic, disinfectant, stimulant, antipruritic, and parasiticide. It is not poisonous. The odor of thyme is at times a disadvantage, since dressings into which it enters attract flies. Many persons object to the persistency of the odor.

General Surgery.—Thymol has been employed by Spencer Wells as an antiseptic in OVARIOTOMY, and is preferred by him to carbolic acid, using a spray of 1–1000, the other solutions being of similar strength for sponges, instruments, and other antiseptic purposes. In the application to BURNS thymol in strength of one to three thousand has been added to ointments, such as oxide of zinc, boric acid, etc. It is asserted that sloughs soon separate under this treatment, and that healthy granulations are formed which rapidly cicatrize. The scars appear to be less irritable than when carbolic acid is prescribed.

Thymol has been used with advantage to correct Offensive Lochia. In Inflammation and Ulceration About the Neck of the Uterus a tampon of cotton saturated with glycerine and thymol 1–1000 to 1–3000 are indicated. Sponges are conveniently preserved in a solution of one part of thymol in sufficient quantity of alcohol added to one thousand parts of water.

Diseases of the Skin.—Thymol was introduced in 1878 by Crocker, of London (*New Remedies*, April 16, 1878), as a remedy in certain skin diseases.

Crocker proposed the following formulæ: ℞. Thymolis, gr. v–xxv; vaseline, ℥j. M. Solve. ℞. Thymolis, gr. v; alcoholis, glycerini, āā f℥j; aquæ, *ad.* f℥viij. M. ℞. Potassii thymolat,* gr. v–℈iv; aquæ, f℥viij. M.

When the vaseline ointment is stronger than twenty grains to the ounce the thymol should be first dissolved in alcohol in the proportion of one minim to the grain.

Thymol is an irritant to the skin in a concentrated form, but when the strength is properly adjusted it is said to afford an agreeable substitute for tar.

In Pityriasis Capitis Crocker recommends: ℞. Thymolis, ʒj; liq. potassæ, fʒj; glycerini, fʒss; aq. sambuci, f℥viij. M.

In Eczema G. H. Fox, of New York, recommends the following: ℞. Thymolis, gr. v; ung. aquæ rosæ, ℥j. M.

In Tinea Tricophytina Capitis (*ringworm of the scalp*) Besnier, of Paris, uses: ℞. Thymolis, gr. viij; glycerini, fʒiv; alcoholis, fʒiv; aquæ, *ad.* f℥viij.

In Psoriasis Crocker begins with an ointment of five grains to the ounce, gradually increased to thirty grains to the ounce.

Diseases of the Nose and Throat.—Thymol is used in the treatment of the nose and the throat as a substitute for carbolic acid. It is especially useful (1–1000 or 1–3000) in Pharyngitis and Laryngitis of the exanthemata, particularly when associated with putrid exhalation. As a mouth wash thymol is effective in removing the odor of tobacco after smoking. After the septic coagulant in Diphtheria is removed a preparation of thymol, from two to twenty grains to the ounce of water, either alone or in the presence of five grains of carbolic acid or a little glycerin, is a treatment commended by Da Costa and S. Johnston.

R. W. Seiss (*Med. News*, April 2, 1887) finds that one-half grain of thymol by the addition of one-half drachm of alcohol and a drachm and a half of glycerin to the ounce of water forms a preparation of minimum strength from which a therapeutic effect can be expected. A stronger solution is composed as follows: Five grains of thymol to one-half ounce each of alcohol and glycerin. The reporter believes that such preparations are of use in the treatment of ATROPHIC NASAL CATARRH. Weak solutions may be employed in the form of a spray, but stronger ones only by means of cotton carriers. Magnesium carbonate aids in the diffusion. Lefferts proposes the following: Six grains of thymol in a drachm of alcohol to the ounce of water, to which has been added three grains of magnesium carbonate; a teaspoonful to a pint of water at 140° F. as an inhalant. Thymol excites the flow of blood through the lungs, the parts becoming reddened during inhalation. (A. Israi.)

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* The thymolate of potassium results from mixing a saturating solution of potassium hydrate with thymol.

Thymol is also used extensively by Volckmann as follows, as a spray: Thymol, one part; alcohol, twenty parts; glycerin, twenty parts; and water, one thousand parts. Thymol, according to W. D. Miller, ("Micro-organisms of the Mouth") arrests DENTAL CARIES.

TRYPSIN.

Trypsin is a ferment present in the pancreatic juice. It has the property of digesting proteids and is active only in neutral or alkaline solutions.

Trypsin is a digestive solvent.

Diseases of the Throat.—Trypsin has been used especially in dissolving (*i. e.*, digesting) the DIPHTHERITIC EXUDATION. It is tenacious in character when mixed with mucus and readily adheres to the parts to which it is applied. When smeared upon the tonsils the ordinary act of deglutition will not dislodge it. Since trypsin acts only when it remains neutral or is alkaline, J. Lewis Smith (*N. Y. Med. Ass'n*, December, 1887) has proposed the use of the following preparation:—

℞. Sodii benzoat., ʒj–ij; sodii bicarb., ʒij–iij; trypsin, ʒj; ol. eucalypti, ʒj; liq. calcis, Oj.

A simpler formula is herewith given:—

℞. Trypsin, gr. xxx; sodii bicarb., gr. x; aquæ dest., ℥j. Make a smooth mixture and apply with a brush or by spraying. Samuel Johnson recommends the following: Thirty grains each of trypsin and bicarbonate of sodium, to an ounce of water in which one-quarter of a grain of corrosive sublimate and a drachm of glycerin has been added. Warm the mixture and use a soft brush; when the membrane begins to soften apply a spray of peroxide of hydrogen, one part to six, every hour.

TUMENOL.

A petroleum product discovered by Spiegel. It occurs in the form of a dark-brown or brownish-black liquid; a "tumenol sulphone;" an oil; and a powder, "tumenol sulphuric acid." (*Pharm. Journ. and Trans.*, November, 1891.)

It has recently been brought forward by Neisser as a partial substitute for ichthyol. (*Deutsch. med. Wochenschr.*, No. 45, 1891.)

Tumenol is antiseptic, antipruritic, and parasiticide.

Diseases of the Skin.—Moist compresses soaked with a two per cent. solution of the tumenol-sulphuric acid have been found useful in the treatment of ACUTE RECURRENT ECZEMA of the hands and face. In the form of a five to ten per cent. paste tumenol oil has proved of use in SUPERFICIAL ULCERATION, IMPETIGO, and PEMPHIGUS. An ointment of similar strength with five per cent. of zinc oxide and nitrate of bismuth with lard as a base has been employed by Neisser with success.

Tumenol also acts as an antipruritic. A ten per cent. tincture made up with equal parts of either alcohol, glycerin or water, relieves the itching of ECZEMA, PRURITUS, and PRURIGO.

Tumenol lacks the penetrating anti-parasitic and absorption-promoting effect of ichthyol. There is, therefore, according to Neisser, no indication for its use in erysipelas, or in the local treatment of exudations or infiltrations.

ULMUS. Elm. Slippery Elm.

"The inner bark of *Ulmus fulva.*" (U. S. P.) Elm bark contains an abundance of mucilaginous matter, which is readily extracted by water, but not precipitated by alcohol. It contains tannic acid, a trace of essential oil, to which its peculiar odor is due. Fat melted in the presence of elm bark is preserved. *Mucilago Ulmi* is official; it is made by macerating six parts of the sliced dried elm bark in one hundred parts of boiling water for two hours and straining.

Elm is demulcent and hygroscopic.

General Surgery.—Elm makes a soothing poultice. It can be employed for all purposes where flaxseed is indicated. Pieces of the bark can be compressed and made into tents of required shapes and used as substitutes for sponge and sea-tangle in dilatation of fistulous tracts, strictures, the cervix uteri, etc.

Diseases of the Throat, etc.—Elm is used in the form of a lozenge, three to five grains in each mass, as an adjuvant in the treatment of PHARYNGITIS.

VERATRINA. Veratrine. Veratria. (U. S. P., 1870.)

" An alkaloid or mixture of alkaloids prepared from the seeds of *Asagræa officinalis*. A white, or grayish-white, amorphous, rarely crystalline powder, permanent in the air, odorless, of a distinctive acrid taste, leaving a sensation of tingling and numbness on the tongue, causing contraction of the fauces, and highly irritant to the nostrils. Veratrine is very slightly soluble in cold or hot water, but imparts to it an acrid taste and a feebly alkaline reaction. In boiling water it strongly cakes together without melting. It is soluble in three parts of alcohol at 15° C. (59° F.), very soluble in boiling alcohol; also soluble in six parts of ether, in two parts of chloroform, in ninety-six parts of glycerin, and in fifty-six parts of olive oil." (U. S. P.) Two preparations are official, *Oleatum Veratrinæ* (containing two parts of veratrine dissolved in ninety-eight parts of oleic acid) and the *Unguentum Veratrinæ* (containing four parts of veratrine dissolved in six parts of alcohol and incorporated with ninety-six parts of benzoinated lard). In practice, more than six parts of alcohol is necessary to dissolve the veratrine; better solvents than alcohol are chloroform and acetic acid.

Veratrina is revulsant and parasiticide. When brought in contact with cutaneous surfaces, it is exceedingly irritating, producing a feeling of warmth followed by a sense of tingling.

General Surgery.—In NEURALGIA, especially in TIC DOULOUREUX, the ointment of veratrine rubbed into the affected part until it causes a sense of tingling, is often productive of great relief. Veratrine, twenty-five grains; alcohol, six drachms; glycerin, two drachms; painted along the course with a camel's hair brush twice daily. It should not be applied if inflammatory symptoms are present. (Waring.)

Diseases of the Ear, Nose, etc.—E. Peugnet (*Amer. Jour. of Syphilog. and Dermatolog.*, 1872, Vol. III, p. 209) uses veratrine in the treatment of ASPERGILLUS. Two grains of veratrine with one-half ounce each of rose-water and glycerin to which ten minims of acetic acid have been added, is penciled over the infected surfaces. Veratrine is employed by dentists as an obtundent of sensitive dentine.

Diseases of the Eye.—Veratrine has been highly commended by some ophthalmic surgeons as a remedy in ORBITAL NEURALGIA and in ASTHENOPIA. It is applied to the temple and brow in the form of ointment, containing from one to four grains to the drachm, according to the degree of irritation desired and the sensitiveness of the skin. The proportion in the official ointment is one part in twenty-six and a half. Great care is necessary to keep it out of the eye, as it causes a violent and persistent conjunctivitis. The oleate (1–50, U. S.) is an elegant preparation.

It is doubtful whether this drug has any therapeutic effect (as an external application) that cannot be attributed to the counter-irritation that it produces.

XANTHOXYLUM. Xanthoxylum. Prickly Ash.

"The bark of *Xanthoxylum fraxineum* and of *Xanthoyxlum carolinianum*." (U. S. P.) The constituents of the prickly ash bark are a volatile oil, a resin, a gum, and a crystalline principle—xanthoxylin. The official preparation is a fluid extract (one cubic centimetre of which represents the activity of one gramme of the bark).

Prickly ash is stimulant and sialogogue.

Diseases of the Mouth, Throat, etc.—Inhalations from hot infusions of prickly ash have long been used in domestic medicine for ACUTE CATARRHAL SORE THROAT. A decoction of the bark is employed for application to ULCERATION OF ORAL MUCOUS SURFACES (J. W. White, "Dental Materia Medica.")

YERBA REUMA.

The leaves of *Waukenia grandiflora*. Yerba reuma contains a resin, a peculiar astringent principle, and a large percentage of sodium chloride, to the combination of which its therapeutical properties are largely attributable.

Yerba reuma is astringent.

Diseases of the Throat and Nose.—Yerba reuma may be used in the form of a gargle, which is composed of the fluid extract of the herb diluted with three times its bulk of water. An ounce of the tincture (in the strength of four ounces of the fluid extract to the pint of alcohol) added to three ounces of water and used as an injection, is reported to be efficient in some CATARRHAL AFFECTIONS OF THE NOSE.

ZINCI ACETAS. Acetate of Zinc.

Acetate of zinc is "soft, white, micaceous, or pearly six-sided tablets or scales, somewhat efflorescent in dry air, having a faintly acetous odor, a sharp, metallic taste, and a slightly acid reaction. Soluble in three parts of water and in thirty parts of alcohol at 15° C. (59° F.), and in 1.5 parts of boiling water, and in three parts of boiling alcohol." (U. S. P.)

Acetate of zinc is astringent.

General Surgery.—Acetate of zinc resembles the sulphate of zinc in its action. Solutions are often employed as injections in GONORRHŒA in the strength of two to five grains to the ounce of water. A solution containing a mixture of acetate of lead and sulphate of zinc is recommended by Sir Astley Cooper, notwithstanding that a double decomposition takes place between the ingredients. The preparation is a valuable one after the acute stage of the disease is passed.

Diseases of the Skin.—The acetate of zinc has been employed in the form of an astringent wash in Erythema and Eczema by the late Tilbury Fox. He recommends the following formula: ℞. Zinci acetat., gr. ij; aquæ rosæ, f℥j. M.

Diseases of the Nose and Throat.—M. Mackenzie claims efficacy for the acetate of zinc in a solution of the strength of five grains to the ounce of water in Chronic Laryngitis.

Diseases of the Eye.—The effect of the acetate of zinc upon the eye is much the same as that of the sulphate of zinc, though it is rather less irritating.

ZINCI CARBONAS PRÆCIPITATUS. Precipitated Carbonate of Zinc.

Precipitated carbonate of zinc is "a white, impalpable powder, permanent in the air, odorless and tasteless, insoluble in water or in alcohol, but soluble in acids with copious effervescence." (U. S. P.) An impure precipitated carbonate of zinc was official (U. S. P., 1850) under the name of calamina (Calamine). The name calamine is sometimes erroneously applied to the pure preparation. The precipitated carbonate of zinc thus takes the place of "calamine," which is one of the oldest of local remedies. Calamine is gritty and impure, so that the practitioner, in employing the formulæ of the older books, will do well to substitute for it the precipitated carbonate of zinc.

Precipitated carbonate of zinc is slightly sedative and astringent.

Diseases of the Skin.—Carbonate of zinc is employed in the form both of lotion and ointment. In Acute Eczema, when there is no discharge, and in most other active inflammatory conditions of the skin, the following will be found of use: ℞. Pulv. zinci carbonat. præcipitat., pulv. zinci oxidi, pulv. amyli., āā ʒiv; glycerini, fʒiv; aquæ, ad f℥viij. M.

A somewhat similar composition is recommended by Crocker in Acute Inflammatory Conditions of the Skin: ℞. Pulv. zinci carb. præcipitat., ℈viij; pulv. zinci oxidi, ʒiv; glycerini, fʒij; aquæ rosæ, ad f℥viij.

Among the ointments containing carbonate of zinc, "*Turner's Cerate*" was formerly highly prized; it is composed essentially as follows: ℞. Calaminæ præparatæ, ceræ flavæ, āā ℥iij; adipis, ℔ j. Melt the lard and wax together, and when, on cooling, they begin to thicken, add the calamine and stir until cool. Calamine, however, is often sophisticated, and is apt to make a gritty ointment.

A formula better adapted for modern use, is: ℞. Pulv. zinci carbonat., ʒij; ung. adipis, ʒx. M. This, like the lotion, is a cooling ointment in acute inflammatory conditions of the skin.

ZINCI CHLORIDUM. Chloride of Zinc.

Chloride of zinc is a "white, crystalline powder, or white, opaque pieces, very deliquescent, odorless, having a very caustic, saline, and metallic taste, and an acid reaction. The salt is very soluble in water and in alcohol, forming a clear or only faintly opalescent liquid. This opalescence is removed by the addition of a few drops of hydrochloric acid." (U. S. P.) For composition of Canquoin's caustic ("Pâte de Canquoin," Codex), *vide infra*, p. 441.

In England a popular form of chloride of zinc, for purposes of disinfection, is known as *Sir W. Burnett's Fluid.*

Chloride of zinc is caustic, astringent, excitant, disinfectant, and slightly hæmostatic, according to the strength of the preparation.

The caustic action of chloride of zinc is mainly due to its powerful affinity for water. When brought in contact with the tissues in a concentrated form it destroys them, by robbing them of their water of constitution. The affinity for water being fully satisfied, the caustic action ceases, and another influence comes into play, namely, the affinity of the salts of zinc for organic matter. In this way a compound is formed between the solids and fluids at the surface (of a wound, for instance) which prevents decomposition and inhibits the rapid changes incident to suppuration, while not impairing the reparative process. In these respects chloride of zinc resembles carbolic acid, and is, equally with it, a valuable curative agent.

If for any reasons, as in attacking resisting morbid masses involving the skin, a chloride of zinc paste be demanded, the formula of Jules Felix (commended by Crocker) can be used with advantage: ℞. Zinci chloridi exsiccat., grs. cx; amyli, grs. xxvij; farinæ tritici, grs. cxij; hydrargyri bichlor., gr. j; iodol, grs. x; croton chloral, grs. x; camphor. bromid., grs. x; acid. carbolic. cryst., grs. x. Mix in a mortar, in powder, then gradually add enough distilled water to make a homogeneous paste of the consistence of putty. It will keep a long time. The hands should be moistened in applying it, and the paste allowed to remain on from six to twenty-four hours. The bichloride of mercury, iodol, and the croton chloral can be omitted without materially affecting the action.

In the main, chloride of zinc, when employed as an escharotic, can be readily managed by the use of specially prepared lint. The following procedure is recommended: Steep a piece of sheet lint in a saturated solution of the salt (the fluid resulting after placing a few drops of water on a clump of crystals) and dry. Pieces of convenient size are cut off from the sheet and applied to the part which it is desired to cauterize. Lint thus prepared will keep for a long time if placed in a tight-fitting box and preserved from moisture.

Owing to the deliquescent character of the chloride of zinc its properties for other than caustic purposes are best secured in solution. These are usually simple in character, at most a small quantity of glycerin only being added. The effects of the solutions are in direct ratio with their strengths, and bear an exact relation to the character of the tissues to which they are applied.

General Surgery.—Chloride of zinc is a valuable escharotic in the treatment of CANCER. In cases which do not permit of operation "Canquoin's paste" may be laid over the exposed surface and allowed to remain from six to twenty-four hours. Haberlin finds a marked amelioration of the condition of the parts in UTERINE CANCER upon application of the paste on cotton held against the cervix by a vaginal tampon. E. Van de Warker has revived a method of using chloride of zinc in uterine cancer after amputation of the cervix. The following description is condensed from "Mann's American System of Gynecology:" The cervix is removed at the vaginal junction, extending, however, with knife or scissors to the os internum. Hemorrhage is checked by packing the cavity with masses of cotton prepared by immersion in a solution of persulphate of iron in the proportion of one to three of water and squeezed nearly dry. This dressing should be removed on the third day. The canal and uterine cavity are then packed with pledgets (pieces about the size of a chestnut) of absorbent cotton soaked in chloride of zinc solution. Two strengths are in use; one of five drachms to the ounce, and a second of equal parts of the salt and water. The weaker solution is used when the uterine walls are thin, to avoid danger of involvement of the peritoneum; the stronger solution is indicated when the walls are of normal thickness. The thickness of the uterine walls can be gauged at the time of operation by introducing the finger into the uterine cavity and a sound into the bladder and rectum. To protect the vagina and the vulva, they should be anointed before the operation with a pomade containing one part of bicarbonate of sodium to three of cosmoline. The pain following the application of the escharotic is often severe, requiring hypodermic injections of morphine. The packing should be removed on the second or third day, when this can be done without force; but when the dressing is firmly cemented, it is better to wait a day or two longer. The slough separates in from five to ten days. If the strong solution has been employed, the slough is thrown off in a single piece. Cicatrization is complete in from two to four weeks, and is followed by marked contraction of the uterine cavity. In a case of cancer of the cervix and body of the uterus, we recently employed the stronger solution. By its action a slough comes away in one piece the shape and size of the interior of the uterus. The complete relief of pain, hemorrhage, and discharge was marked, and continued for many months. The cautery treatment should not take the place of methods of extirpation when these are practicable. Munde treats ENDOMETRITIS by mopping out the cavity of the uterus with a five per cent. solution of zinc chloride, the applicator being introduced several times to be sure that no part remains untouched. Afterward the cervix is covered with iodoform, the vagina freely anointed with cosmoline, and the patient placed in bed. In a week or ten days the sloughs separate, when a second application of twenty grains to the ounce may be made. J. Ashhurst paints the wound after excision of a malignant growth with a solution of chloride of zinc, fifteen grains to the ounce of water.

Sharpened crayons or "arrows" are also introduced concentrically about superficial neoplasms, as recommended by Maisonneuve. Hypodermic injections may be substituted (J. Y. Simpson).

In the treatment of HYDROCELE M. Potaillon employs a 1–10 solution. The claim is made that the application is less painful than the injection of tincture of iodine, and that the results are equally good. Lloyd commends an injection of a fluid composed of one grain of chloride of zinc to the ounce of water in the treatment of GONORRHŒA. The application is repeated in six hours, absolute rest being enjoined. Ringer recommends for the same disease an injection composed of two grains of chloride of zinc and water one pint, to be employed hourly. If used in the first stage of the attack, the symptoms disappear within twenty-four or forty-eight hours. Rest, if possible, should be enjoined. If frequent exhibitions cause pain in the testicles, these should be supported with a well-fitting bandage. A strong solution of the chloride of zinc is extolled in irrigating POISONED WOUNDS received in dissection.

Diseases of the Skin.—The late Mr. Startin, of London, employed the following combination in some "ULCEROUS" and "TUBERCULOUS" affections: ℞. Pulv. zinci chloridi, ʒiv; pulv. antimonii chloridi, ʒij; pulv. amyli., ʒj; glycerini, q. s.

"*Canquoin's Paste,*" a well known preparation, is prepared, according to different authorities, in a variety of ways. The U. S. D. contains the following formula: ℞. Zinci chloridi, ℥j; pulv. amyli (exsiccat.), ℥ij–iij–iv; aquæ, ♏xxx–xl–fʒj. M. The amount of water is estimated in each case as sufficient to form a paste, the caustic strength, of course, being greater in each proportion given above.

Another formula is herewith given: ℞. Zinci chloridi, ℥j; zinci oxidi, ʒj; amyli (exsiccat.), ℥j; aquæ, fʒj. Mix the oxide of zinc and the flour, and then rub up in a mortar with the water. To be kept in a glass-stoppered bottle, covered with powdered starch.

A. Ure employs anhydrous sulphate of calcium instead of flour to dilute the chloride of zinc.

Diseases of the Ear, Nose, Throat, etc.—For free use over large surfaces, especially where the parts to be affected are covered for the most part by thin mucous membrane, the weaker preparations of chloride of zinc, namely, from two to five grains to the ounce, are alone used. A lotion for OTORRHŒA is instilled in the strength of two grains to the ounce. In EMPYEMA OF THE MAXILLARY SINUS a strength of one grain in an ounce of water suffices. For the nasal chamber this may be slightly increased, though weak solutions should be first used and the parts accustomed gradually to the effects of stronger ones. As a gargle the proportions of one grain to the ounce is not often exceeded.

In treating surfaces which are lymphoid in character, and which exhibit the effects of chronic inflammation or have undergone fibroid degeneration, solutions of chloride of zinc to be astringent, or even excitant, must be stronger than those above enumerated. Thus, in SYPHILITIC PHARYNGITIS, a pigment of twenty grains to the ounce is recommended. In non-specific CHRONIC PHARYNGITIS the solution should be somewhat weaker, namely, about fifteen grains to the ounce. An application with a cotton carrier of twenty to forty grains to the ounce, may be used to the separate rounded masses of induration about the orifices of glands in CHRONIC FOLLICULAR PHARYNGITIS. Sluggish ABSCESSES of the roof of the mouth and gums are successfully treated by solutions of forty grains to the ounce. If a cartilaginous or fibrous structure be inflamed, a yet stronger preparation is well borne. Hence, strengths of from thirty to sixty grains to the ounce may be applied over small areas of an ULCERATED TRIANGULAR SEPTAL CARTILAGE, or to the vocal cords or epiglottis in CHRONIC LARYNGITIS. The hæmostatic and disinfectant properties of chloride of zinc are but little used in the respiratory tract. J. W. White ("Dental Materia Medica") speaks of twenty grains to the ounce being hæmostatic to the gums.

The caustic effects are rarely sought for on mucous surfaces. Erichsen ("System of Surgery," Am. ed., Vol. II, 386) refers to its employment in the destruction of NASAL POLYPUS. A twenty per cent. solution is used by Wilhelmy (*Deutsch. med. Wochenschr.*, February 4, 1892) in DIPHTHERIA. Pieces of absorbent cotton, held in an appropriate holder, are saturated with the pigment and rubbed in the affected surfaces. The treatment is remarkably efficient, though severe pain ensues. Florin (*La Pratique Méd.*, VI, No. 21; abst., *Ther. Gaz.*, 1892, 483) advises, indeed, that a saturated solution be applied in this disease. The claim is made that the salt attacks ulcerated surfaces only. Four drachms each of chloride of zinc and the powdered yellow Peruvian bark are mixed with honey to make a thick paste, and applied by a brush with freedom to the parts. The false membrane is removed and a dense non-absorptive albuminate of zinc is formed in the deeper tissues.

Diseases of the Eye.—Chloride of zinc is a useful remedy in the different forms of CHRONIC CONJUNCTIVITIS, and may often be advantageously alternated with nitrate of silver, in the same proportions, as an application to the everted lid in TRACHOMA. Only rather weak solutions (from one-quarter of a grain to two grains to the fluidounce of water) should be given to patients to instil into the conjunctival sac.

ZINCI IODIDUM. Iodide of Zinc.

Iodide of zinc is "a white or nearly white granular powder, very deliquescent, odorless, having a sharp saline, and metallic taste, and an acid reaction; very soluble in water and in alcohol." (U. S. P.)

Iodide of zinc is escharotic, astringent, stimulant, antiseptic, and probably parasiticide.

Diseases of the Skin.—The stimulant properties of iodide of zinc are sometimes taken advantage of in the treatment of ACNE. The following formula may be employed: ℞. Zinci iodidi, gr. v; vaseline, ℥j.

Diseases of the Nose and Throat.—According to Lefferts, a mixture of 240 grains of iodide of potassium and 480 grains of iodine and three drachms of water added drop by drop to 200 grains of sulphate of zinc, and 140 minims of distilled water forms an escharotic iodide of zinc which is well adapted for use in the throat and nose. A solution of fifteen grains to the ounce is recommended by S. Johnston as a lotion in the treatment of POST-NASAL CATARRH. In a strength varying from five to twenty grains to the ounce, iodide of zinc is astringent. J. J. Ross employs a solution of thirty grains to the ounce as a pigment in the reduction of TONSILLAR HYPERTROPHY.

ZINCI NITRAS. Nitrate of Zinc.

This salt is best prepared by neutralizing nitric acid with oxide of zinc. It occurs in colorless, prismatic crystals, which deliquesce on exposure to air, and are soluble in water and in alcohol.

Diseases of the Skin.—Tilbury Fox advised this remedy in the treatment of the severe and chronic forms of LUPUS ERYTHEMATOSUS according to the following formula: ℞. Zinci nitratis, ʒiss; aqua destillat., fʒj; glyceriti amyli, ʒj; farinæ tritici, ʒj. M. Sig.—Make a paste. The zinc salt is here in the proportion of one to three, but it may be increased to one to two in severe cases. The parts are covered with the paste, and if pain is produced a poultice is applied and the raw surface is dressed with *ung. zinci oxid.*, or *ung. diachylon*. When the sore has dried up or crusted over, the caustic may, if necessary, be re-applied.

ZINCI OXIDUM. Oxide of Zinc.

Oxide of zinc is "a soft, pale-yellowish, nearly white powder, permanent in the air, odorless and tasteless, insoluble in water or in alcohol, but soluble in acids without effervescence (absence of carbonate.)" (U. S. P.) The single official preparation is the ointment *Unguentum Zinci Oxidi*, made by mixing twenty parts of oxide of zinc with eighty parts of benzoinated lard. (See p. 68.)

Oxide of zinc is desiccant, mildly astringent, and slightly sedative.

General Surgery.—Oxide of zinc is often applied to BLISTERS and to BURNS of the second degree. It also hastens the process of healing of wounds by granulation. In "BRUSH-BURN," which, while painful, is not apt to be a serious injury, zinc ointment spread on lint forms an excellent protectant. The ointment is available in the treatment of indolent ULCER OF THE LEG. The edges of the ulcer are first anointed and strips of adhesive plaster applied in the usual way. In CANCEROUS ULCERATION of the mamma, zinc ointment, to which a little carbolic acid has been added, makes a soothing dressing. It should be applied at least every day, after the part has been cleansed with soap and water, and the surrounding portions of the skin bathed with alcohol. ANAL FISSURES and RHAGADES are best relieved by the insertion of a small portion of zinc ointment or powder. Ball (*Albany Medical Annals*, June, 1886) reports favorably of applications of oxide of zinc ointment for deep-seated CHRONIC URETHRITIS. The formula is as follows: Oxide of zinc, three drachms; simple cerate, two drachms; lard, three drachms. The ointment is applied by filling the space between the bulb and the end of the shaft of an olive-pointed bougie, carrying the instrument down the urethra to the desired distance, and retaining it in position until the ointment has melted. A cure is effected in about a month.

A combination of oxide of zinc and the bichloride of mercury has been proposed by Benjamin. It is advised that the oxide of zinc be sterilized by exposure to a temperature of 200° F., and combined with the bichloride of mercury, in the proportion of two ounces of the former to one grain of the latter. The powder can be used as a succedaneum for iodoform.

Diseases of the Skin.—Oxide of zinc enters into the composition of a number of powders, lotions, pigments, and ointments.

The powder is often useful as an astringent in ERYTHEMATOUS and VESICULAR ECZEMA. It is somewhat too astringent, however, in its effect upon sensitive skins and should be mixed, in such cases, with powdered starch, kaolin, or a similar indifferent excipient. The addition of a little camphor powder is of advantage when the skin is unbroken and there is much burning and itching. The following formula is useful: ℞. Pulv. camphoræ, ʒj; pulv. zinci oxidi, pulv. amyli, āā ℥ss. M. The least degree of grittiness in the powders selected may cause irritation.

In the form of sedimentary lotions, oxide of zinc has long been employed alone or combined with other astringents and sedatives. The following are approved formulæ for use in ACUTE ECZEMA, DERMATITIS, IRRITABLE ACNE, and other ACUTE INFLAMMATORY CONDITIONS OF THE SKIN: ℞. Pulv. zinci oxid., ʒij; glycerini, fʒij; liquor plumbi, fʒiss; aquæ calcis, Oss. M.—℞. Pulv. zinci oxidi, ʒij; pulv. zinci carb. præcip., ℥ss; glycerini, fʒij; aquæ rosæ, Oss. M.

"Pastes" or "pigments" of oxide of zinc have been much employed of late years. The following combination, into which the oxide of zinc enters, is a particularly useful remedy in ECZEMA RUBRUM, where the weeping is not excessive. Applications must be made for several successive days, without removal, of the following preparation: ℞. Pulv. zinci oxidi, gr. D; pulv. acid. salicylici, ʒj; acid. carbolici, ʒj; mucilaginis acaciæ, glycerini, āā gr. cc–ccl. M.

Among other kinds of "pastes," which may be employed are those recommended by Lussar, of which the ensuing recipe is an example: ℞. Acidi salicylici, gr. x; pulv. zinci oxidi, amyli, āā ʒij; vaselini, ʒiv. M. The salicylic acid is an incidental addition. This and similar "pastes" (ointments) are useful in hot weather, when fatty ointments disagree. This formula will be found a little stiff in cool weather.

Oxide of zinc enters into the composition of a number of ointments. Of these the oxide of zinc ointment of the Pharmacopœia is that most generally known and most indiscriminately employed in the local treatment of diseases of the skin. It was first brought into use by the eminent English dermatologist, Erasmus Wilson. The slightest grittiness in oxide of zinc ointment should cause its rejection.

Oxide of zinc enters also into the composition of several compound ointments which are of value in the treatment of diseases of the skin, and which may properly be noted in the present place. One of these is the following, recommended by Neumann in SEBORRHŒA and PITYRIASIS, where the skin is inflamed. (It need hardly be said that this and all ointments containing oxide of zinc are out of place on the scalp unless the hair is cut short.): ℞. Pulv. zinci oxidi, ʒj; pulv. plumbi carbonat., ʒj; spermaceti, ℥j; ol. olivæ, q. s. M. Make a soft ointment.

An excellent preparation is the following: ℞. Pulv. zinci oxidi, mellis, āā ℈ij; ceræ flavæ, ʒij; olei amygdalæ, fʒvj. M.

In cold weather the ordinary oxide of zinc ointment may with advantage be made up with an equal part of cosmoline or vaseline.

Oxide of zinc ointment forms the succedaneum to black wash in J. C. White's admirable treatment of acute eczema. (See *Hydrarg. Chlor. Mite.*)

Diseases of the Ear and Nose.—One drachm of the oxide of zinc combined with an ounce each of powdered alum and starch forms an admirable protectant for Acute Eczema of the auricle.

The following preparation was a favorite with Wilde for the treatment of Chronic Inflammation of the Auricle: Req: Acetate of lead, ʒss; oxide of zinc, ʒj; mild chloride of mercury, ʒss; nitrate of mercury ointment, ʒj; lard (washed), ℥ss; pure palm oil, ℥ss. M. With many cases this severe treatment is not absolutely necessary, and the mild mucilaginous applications—the ear being covered by oil-silk—have been attended with success.

The ointment of oxide of zinc is an admirable application to the skin of the external nose. In the form of a powder it is often combined with nitrate of bismuth. Such a combination proves useful chiefly as an exsiccant. It may be dusted upon excoriated skin-surfaces or even carried up the nostril as in an application to Septal Ulcers. It forms a paste with water which is convenient to manipulate.

Diseases of the Eye.—Oxide of zinc ointment is indicated in Eczematous Conditions of the Eyelids, and is much used for the relief of inflammation of the skin caused by irritating discharges from the eyes, particularly in the Ophthalmia of Strumous Children. In some cases the dry powder dusted on the surface of the skin answers better than the ointment.

ZINCI SALICYLAS. Salicylate of Zinc.

A salt obtained by adding oxide of zinc to a hot aqueous solution of salicylic acid as long as it is dissolved. On filtering the solution hot and allowing to cool, the salt crystallizes in long, satiny needles. It is soluble in twenty parts of cold water, and is freely soluble in hot water, alcohol, and ether.

Salicylate of zinc is an astringent.

Diseases of the Nose, etc.—This salt is employed in the form of a nasal bougie for the treatment of Nasal Catarrh; each bougie to contain one grain of the agent.

ZINCI SULPHAS. Sulphate of Zinc.

Sulphate of zinc exhibits "small, colorless, right rhombic prisms, or acicular needles, slowly efflorescing in dry air, odorless, having a sharp, saline, nauseous, and metallic taste, and an acid reaction. It is soluble in 0.6 parts of water at 15° C. (59° F.), and in 0.3 part of boiling water; insoluble in alcohol." (U. S. P.)

Sulphate of zinc is caustic and irritating, astringent and stimulant, hæmostatic, and probably antiseptic. An ounce of the salt dried and finely pulverized, mixed with a drachm of glycerin, is a painful escharotic.

Sulphate of zinc has less affinity for water than the chloride of zinc, and, therefore, is weaker in its action as a caustic than the agent last named. In common with other salts of zinc, it forms an insoluble compound with albumen. It is an astringent in solutions of from two to five grains to the ounce. Thus exhibited, it diminishes secretion from excited mucous surfaces and hastens the formation of granulations in ill-conditioned sores.

General Surgery.—It is claimed that sulphate of zinc has antiseptic properties, and in this way is of value as a vulnerary. Hewston and Tichbourne (*Br. Med. Jour.*, November 8, 1890) prepare a dressing of four layers of dry gauze; the powdered sulphate of zinc is freely distributed between them and the whole applied to the selected surface. Sulphate of zinc is used in the preparation of the Liqueur de Villate,[*] which is extensively employed to assist in the removal of CARIOUS and NECROTIC BONE. A small quantity of the fluid is injected into the sinuses. It is, however, claimed by some that only the outer portion of the bone is decalcified, and that the solution does not come in contact with the more deeply seated portions. An acidulated pepsin solution (*q. v.*) may be kept in contact with the walls of the sinuses to act the part of a solvent.

Sulphate of zinc has an established reputation in the treatment of GONORRHŒA. In the opinion of eminent practitioners, it is the best local remedy in our possession. It is necessary to begin the injections with a weak solution, and increase the strength gradually as tolerance is established. In the early stage of the disease one-half a grain of the salt to the ounce of water will suffice. The sulphate of zinc can be employed with satisfaction in conjunction with acetate of lead. (See *Plumbi Acetas.*) In GONORRHŒA in the female, it is important that the surfaces of the vagina should be kept apart. For this purpose lint cut in long strips is soaked in an initial solution of four grains to the ounce, and introduced into the vagina through a speculum; the region about the os uteri is first packed, that near the vulva being gently distended as the instrument is withdrawn. The strength of the solution is gradually increased, until it represents fifteen grains to the ounce. In each dressing the lint is allowed to remain for about eight hours.

In CHRONIC URETHRITIS IN THE FEMALE, Braxton Hicks has employed with success sticks of sulphate of zinc, introduced into the urethra and permitted to remain there for five minutes. When GONORRHŒA affects the rectum, injections of sulphate of zinc, a drachm to the pint, will be found useful. The same authority has also employed this preparation in

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[*] The following formula is preferred: ℞. Zinc. sulph., cupri sulph., āā gr. xv; liq. plumbi subacetatis, fʒ ss; acid acet. dil., f℥ iiiss.

Leucorrhœa of the Uterine Cervix. The sulphate of zinc was extolled by Sir James Y. Simpson as a caustic in Cancer of the Uterus, but it appears to possess no advantages over the chloride of zinc.

Diseases of the Skin.—T. Fox recommends the following combination in Erythema Intertrigo and in Eczema: ℞. Zinci sulphat., grs. x; pulv. aluminis, ℈j; glycerini, fʒj; aq. rosæ, f℥viiss. M.

A solution of thirty grains of sulphate of zinc to the ounce of water, as suggested by Hardaway, of St. Louis, forms one of the very best lotions for application in Dermatitis Venenata. A more dilute lotion is often of value in Acute Eczema.

Diseases of the Ear, Nose, Throat, etc.—Diffuse inflammation of the external ear is treated by Keene with sulphate of zinc, in the proportion of one-fourth of a grain to the ounce of water. Should ulceration be present, stronger solutions, namely, in strengths from one to four grains to the ounce of water, can be used. (Roosa.) Furuncles in the auditory meatus demand a strength from thirty to sixty grains to the ounce. Sulphate of zinc is also well adapted for Acute or Recent Cases of Chronic Suppuration of the middle ear. A simple uncomplicated Otorrhœa requires but a strength of two grains to the ounce, but a strength of five grains to the ounce is often well borne. W. E. Dalby warmly commends a similar solution for the treatment of the middle ear in Chronic Aural Catarrh, in which there is a perforation of the tympanic membrane. If pain ensues, the lotion may be combined with twenty minims of liquid extract of opium to the ounce of water, or, in its place, of a weak solution of carbolic acid. A solution of two grains to the ounce may be thrown up the Eustachian tube in the treatment of Tubal Catarrh. Three grains to the ounce may be used in Acute Coryza as a spray; as high as ten grammes can be employed for Fetid Coryza. It is available for the arrest of Epistaxis in strengths of from fifty to sixty per cent. It must be used with care as a pigment, with good illumination of the parts, small surfaces only being covered. As in the case of chloride of zinc, weak solutions are best borne in the sinuses. Thus one grain to the ounce of water suffices for treating Empyema of the Maxillary Sinus. In small quantities, equal parts of sulphate of zinc and sugar of milk, together with a small portion of powdered acacia, forms a convenient powder for insufflation in Chronic Pharyngitis. It is but little used. Notwithstanding its unpleasant taste, a gargle is sometimes directed to be used, in the strength of one to five grains to the ounce of water. In Gangrenous Ulceration of the mouth in children, sulphate of zinc has been beneficially used combined with honey, in the strength of twenty grains to the ounce.

In the larynx, solutions of the salt are not employed in uniform strengths. Weak solutions, *i. e.*, those from one to five grains to the ounce, are often efficient in giving tone to the membranes in vocal fatigue, while stronger preparations have been used when a decided impression is to be made upon the vocal cords. Ten to sixty grains to the ounce in this way can be applied to the parts, either in the form of a spray or a pigment. A strength of forty grains to the ounce is commended by C. E. Bean (*N. Y. Med. Journal*, September 24, 1887) in arresting LARYNGEAL HEMORRHAGE.

Mandl makes the commendation that insufflations, in any strength, of sulphate of zinc received in the œsophagus may excite emesis. Nasal bougies are available which contain each one grain of the drug. They are either plain or combined with carbolic acid, one-quarter of a grain; or the fluid extract of hydrastis, five minims; extract of belladonna, one-quarter of a grain; or morphine, one-quarter of a grain.

Diseases of the Eye.—Sulphate of zinc has been extensively used as a collyrium in CONJUNCTIVITIS, and has held its own for many years. Being rather irritating, it is better adapted to chronic than to acute cases. Solutions of from half a grain to two grains to the ounce of water may be used two or three times a day.

ZINCI SULPHOCARBOLAS. Sulphocarbolate of Zinc. Sulphophenate of Zinc.

Sulphocarbolate of zinc is official in the British Pharmacopœia. It is stated that it "may be obtained by heating a mixture of carbolic acid and sulphuric acid, saturating the product with oxide of zinc, evaporating, and crystallizing;" and it is described as in "colorless, transparent, tabular, efflorescent crystals, soluble in about twice their weight of rectified spirit or of water." (See *Sodii Sulphocarbolas.*) The U. S. D. questions the efficacy of the sulphocarbolates.

Sulphocarbolate of zinc is antiseptic and astringent. The property last named is represented in strengths of two to thirty grains to the ounce of water. On the whole, the salt represents the properties of chloride of zinc, but is less irritating.

General Surgery.—Harrison advises the douching or irrigating of the urethra with a solution of the sulpho-carbolate of zinc. It is well to begin with a weak solution, one to three grains to the ounce, and gradually increase its strength.

Diseases of the Ear, Throat, etc.—This salt has been praised as an instillation in the external meatus in OTORRHEA accompanied with perforation of the tympanic membrane, and in ECZEMA OF THE EXTERNAL AUDITORY PASSAGE, as well as in the nose in PURULENT CATARRH of children (in solution of five grains to the ounce) and of the naso-pharynx. It also forms an agreeable and useful spray in CATARRHAL LARYNGITIS.

Sulphocarbolate of zinc is used by some French physicians as an astringent for the nasal mucous membrane. (*Journ. de Méd. de Paris*, 1890.)

ZINCI SULPHIDUM. Sulphide of Zinc. Sulphuret of Zinc.

This compound is found in nature as zinc blende, or it may be prepared as a whitish powder by precipitating acetate of zinc by sulphuretted hydrogen. This method furnishes an impalpable powder adapted to medical use.

Diseases of the Skin.—The sulphide of zinc was recommended some years ago by Duhring (*Philadelphia Med. News*, November 10, 1883) as a remedy in some forms of LUPUS ERYTHEMATOSUS. It is one of the best local applications we possess for the sub-acute forms of this affection. The formula employed is the following: ℞. Zinci sulphat., potassii sulphidi, āā ʒss; aquæ rosæ, f ℥iij; alcoholis, fʒiij–vj. M.

A double decomposition takes place, and the sulphide of zinc is the result.

This preparation should not be used in the acute exacerbations which occur in lupus erythematosus, when purely sedative remedies alone should be employed. When, however, the disease is in a quiescent and not highly inflammatory condition—in the sub-acute stage of its progress, in fact—this preparation is useful.

ZINCI TANNAS. Tannate of Zinc.

When a solution of acetate of zinc is treated with a solution of tannic acid a white precipitate of tannate of zinc is formed. When this is collected, washed, and carefully dried, it furnishes a fine, nearly white powder, insoluble in water, in alcohol, and in ether.

Diseases of the Nose, etc.—Tannate of zinc is used by some French physicians as an astringent for the nasal mucous membrane. (*Journ. de Méd. de Paris*, 1890.)

APPENDIX.[*]

ACONITUM. Aconite.

"The tuberous root of *Aconitum napellus*." (U. S. P.)

In the Ph. Br. both the leaves and the root of *Aconitum napellus* are official, but in the U. S. P. the root only is official. Aconitina is official in the Ph. Br. The products used under the names of aconitine, aconitina, and aconitia are so varied in activity that there is great danger in prescribing them.

The doses of the galenical preparations of aconite are so small, and their activity applied externally so great, that there is rarely an excuse for risking the danger incurred in prescribing the alkaloid. The preparations suitable for external use are Extractum Aconiti (of variable strength), Extractum Aconiti Fluidum (one cubic centimetre equals one gramme of the root), and Tinctura Aconiti Radici (five parts representing two parts of the root).

General Surgery.—Aconite, owing to its benumbing influence upon the skin, is often added with advantage to liniments for the relief of neuralgic and rheumatic pains. The tincture is frequently employed in the local treatment of SCIATICA and TIC DOULOUREUX, by being painted frequently over the course of the painful nerve. Toothache is sometimes speedily cured by rubbing the gums with a few drops of the tincture, or introducing it on cotton into the carious tooth. As stated by Ringer, if aconite succeeds at all its action is usually prompt.

Diseases of the Skin.—The local action of aconite is possibly to paralyze the vaso-motor nerves. It produces also tingling, prickling, heat, and numbness.

This effect is taken advantage of in the treatment of skin diseases accompanied by pain or pruritus. In PERNIO (chilblain) tincture of aconite often allays the burning and tingling pain. In HERPES ZOSTER also the external application of the tincture has proved of service.

In ALOPECIA a mixture of aconite tincture with other ingredients has proved valuable as a local application. ℞. Tinct. aconit. rad., fʒiv; chloroform., fʒij; liq. ammoniæ, fʒj; pulv. camphoræ, ʒj; ol. olivæ, fʒvij. M. This mixture has undoubtedly proved efficacious, although how much of the effect has been due to the aconite it is impossible to say.

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[*] The insertion of the accounts of Aconitum, Ammonii Carbonas, Ammonii Chloridum, Aqua Ammoniæ Fortior were inadvertently omitted at their proper places in the text.

Diseases of the Throat, etc.—One-half drachm of the tincture of the root diluted in eight ounces of water has been used with advantage as a gargle in Acute Pharyngitis where great pain and muscular irritability were prominent symptoms, according to T. F. Rumboldt. (*St. Louis Med. Arch.*, 1873.) From the potent nature of this drug it is evident that such a solution must be used with great caution.

E. D. Shurly (*N. Y. Med. Journal*, September 11, 1886) believes that aconite is not of sufficient value to compensate for its unpleasant effects. R. C. Brandeis (*Archives of Otology*, vol. XIII, 1884, p. 18) recommends the use of the tincture of aconite in relieving painful affections of the ear.

Aconite lozenges are prepared—each lozenge containing one-half minim of the tincture. (B. P.)

The *oleate of aconitine* in a two per cent. solution is recommended by S. Solis-Cohen (*N. Y. Med. Journal*, March 6, 1886) in painful affections of the throat.

Diseases of the Eye.—Aconite is useful as an application to the skin in Orbital Neuralgia. The tincture is used alone or in combination with chloroform and camphor. It produces a tingling sensation followed by numbness.

The alkaloid aconitin is official in the Br. Ph., but not in the U. S. P. The former directs unguentum aconitinæ to be made by dissolving eight grains of aconitin in one-half drachm of rectified spirit and mixing with an ounce of benzoated lard. It may be used on the brow in twice this strength, but should not be allowed to come in contact with the delicate skin of the lid.

AMMONII CARBONAS. Carbonate of Ammonium.

Carbonate of ammonium is decomposed by acids, the acid salts, the fixed alkalies, and their carbonates, lime-water and magnesia, solution of chloride of calcium, alum, most solutions of iron salts, corrosive sublimate, the acetate and subacetate of lead, and sulphate of zinc. (U. S. D.) It is soluble in four parts of cold water.

Carbonate of ammonium is refrigerant and stimulant.

Diseases of the Skin.—The carbonate of ammonium possesses the peculiar property of dissolving the epidermic scales met with so abundantly in psoriasis, and thus prepares the way for subsequent local treatment. It probably owes its value in this respect to its alkaline character. The following formula is employed: ℞. Pulv. ammonii carb., gr. c.; lanolin, ʒiv ; ung. aquæ rosæ, ℥j. M.

The Spiritus Ammoniæ Aromaticus, which is essentially a solution of carbonate of ammonium, containing in addition an excess of aqua ammoniæ, is used in pityriasis and other diseases of the scalp, where it is employed to dissolve the fats and hasten the cleansing of the diseased parts of scales.

It is sometimes combined with more active stimulants, as in the following: ℞. Sp. ammoniæ aromat., tinct. cantharidis, aq. rosæ, āā ℥ss.

Diseases of the Throat.—A teaspoonful of the aromatic spirit in a pint of water at 80° F. to 100° F. is recommended by Lefferts as a stimulant in the first stage of acute inflammation of the throat. F. H. Hooper (Trans. Amer. Laryngol. Ass'n., 1887, p. 159) directs that a gargle composed of thirty to forty drops in a half tumbler of soda water be used for the relief of the distress arising from straining the throat muscles in singing. The vapor from common smelling salts is of popular esteem in ACUTE CORYZA.

AMMONII CHLORIDUM. Chloride of Ammonium. Muriate of Ammonia. Sal Ammoniac.

This occurs in both a crude and purified condition. The purified salt only is intended. "Soluble in three parts of water at 15° C. (59° F.), and in one and thirty-seven hundredths parts of boiling water; very sparingly soluble in alcohol." (U. S. P.)

Nascent chloride of ammonium (in a gaseous or vaporous condition) for inhalation may be made by mingling, by means of a proper apparatus, the vapors of hydrochloric acid and of ammonia. This nascent, gaseous salt should be washed by being passed through water before inhalation, in order to free it from any excess of either constituent. There are many cheap and efficient inhalers for its generation and inhalation in the shops.

General Surgery.—The chloride of ammonium has a much more extensive range of application than have other salts of ammonium. A solution is useful in the treatment of INFLAMMATORY SWELLINGS. It is also indicated in the removal of the ECCHYMOSIS of BRUISES. In resolving the induration following SUPPURATIVE MASTITIS, the following lotion, originally prescribed by Justamond, has been found of service: ℞. Ammonii chlor., ℥j; spr. rosmarini, Oj. Lint is saturated with this and kept constantly over the part. Solutions of chloride of ammonium may also be used in other glandular enlargements, such as INDOLENT BUBOES, which are said to subside rapidly under the application of a hot solution, two drachms to an ounce. In EPIDIDYMITIS and ORCHITIS a solution of chloride of ammonia, half an ounce to one pint, will often be found a valuable application. We have employed it with advantage in the treatment of CONGENITAL HYDROCELE in the strength of ten grains to the ounce of water. A lotion of three drachms to the pint is available in the treatment of VAGINITIS, used either as an injection or tampon. In the form last named strips of lint are saturated with the solution and left in position for twenty-four hours. In the absence of ice, the cold produced by dissolving muriate of ammonia with nitrate of potash may sometimes be taken advantage of. When two solutions containing respectively five parts of muriate of ammonia and five parts of nitrate of potash, in sixteen parts of water, are mixed, the temperature of the combined solutions will fall from 50° to 10° F. This is placed in a bladder and may be applied to HERNIAL TUMORS and used to promote their reduction. According to Gru (*Brit. Med. Jour.*, January 18, 1868) placing the affected foot in a foot bath containing eight ounces of the drug affords relief to the pain of SENILE GANGRENE when opium fails.

Diseases of the Ear, Throat, etc.—Chloride of ammonium is a mild solvent and increases the normal secretion. It closely resembles the action of sodium carbonate in most affections of the respiratory passages, but the indications for its use are more precise. Since the recommendation of Von Troeltsch, the nascent fumes of the salt have a reputation in the treatment of CHRONIC AURAL CATARRH. The vapor is carried into the Eustachian tube by the catheter. Various forms of apparatus exist by means of which the vapors of carbonate of ammonium and hydrochloric acid are brought into contact. The resultant white fumes are thrown into the catheter by means of a Richardson bulb. Mr. F. E. Morgan, of Philadelphia, has recently offered a compact and portable apparatus of the kind. The value of this treatment for the reduction of submucous thickenings has undergone some fluctuations. In the treatment of the ear a solution of two to five grains to the ounce may be used instead of the nascent vapors. For acute perforation of the tympanic membrane English writers speak of the efficiency of a solution of the same strength instilled into the meatus. Its chief advocate in pharyngeal conditions in this country has been J. Solis-Cohen. Many agree with C. Seiler that the good effects of the agent are transient. T. F. Rumbold (*St. Louis Archives*, 1873) uses a solution of five or ten grains to the ounce as a gargle in CHRONIC PHARYNGITIS characterized by dilatation of the superficial veins, as occasionally observed in the aged. He observes that it cannot be used for a long time, since the continued impression aggravates the complaint.

B. Robinson (Trans. Amer. Laryn. Ass'n, 1887, p. 156) commends the use of ammonium chloride tablet triturates (one every fifteen minutes) in the CHRONIC LARYNGITIS of professional singers. Some of the good effects of the treatment are probably topical. A spray of a solution of one to twenty grains to the ounce is an old preparation for the treatment of FETID CORYZA, but it is greatly inferior to many other agents now in use. Four grains to the ounce have been employed in inhalation though dependent on diminished secretion of trachea and bronchi. The unpleasant saltish taste of the ammonium chloride renders it an unsuitable drug for concentrated use. Prolonged impressions by inhalation may be followed by depression of the general strength.

Ammonium chloride is frequently employed as an ingredient of a lozenge for CHRONIC PHARYNGITIS of a mild grade. Each lozenge and pastille should contain about two grains of the drug.

AQUA AMMONIÆ FORTIOR. Stronger Water of Ammonia.

"An aqueous solution of Ammonia (NH_3), containing 28 per cent., by weight, of the gas. (U. S. P.)

Ammonia is stimulant and even vesicant. In weak solution it is refrigerant. Stronger water of ammonia, applied to the skin, has a slight rubefacient effect when allowed to evaporate. It is in repute as an antidote to the venom of serpents.

General Surgery.—Avendano (*Lancet*, January 9, 1886) speaks in the highest terms of ammonia in the treatment of anthrax and carbuncle. He says that it is a specific, and should always be used. In malignant pustules, after an incision has been made, some drops of the official solution should be introduced into the wound with the hope of destroying the bacilli.

When evaporation is prevented ammonia soon passes through the epidermis and acts as a powerful vesicant, and can be thus employed for that purpose. It can be employed for vesicating purposes when cantharides is objectionable and when a prompt action is desired. Vesication is best produced by saturating a pledget of cotton with the ammonia water and applying the cotton to the skin and covering it with a watch glass, which is to be kept in place until a red ring is formed around the glass. The glass may then be removed and a poultice applied. In this way a blister can be produced in from ten minutes to half an hour. This method is, however, somewhat uncertain, and occasionally fails altogether.

The pain and swelling resulting from poisoning by nettles and insect-bites can be greatly lessened by rubbing the water of ammonia over the part affected. The poison of spiders and wasps, and of similar creatures, is said to contain formic acid, and it is probable that the ammonia acts by neutralizing the acid. Aqua ammoniæ has long been used in the treatment of bites of serpents. It should be rubbed and injected into the bitten part. Halford (*Lancet*, January 30, 1869) strongly recommends the intravenous injection of aqua ammoniæ and distilled water (one part to two) in the treatment of snake bite. The mixture should be slowly injected into a superficial vein by means of a hypodermic syringe, and the injections should be repeated as soon as any beneficial effect from it ceases.

Of twenty apparently hopeless cases in which this method of treatment was employed, seventeen recovered. (*Brit. Med. Journ.*, August 27, 1870.) In similar cases, where Sir Joseph Fayrer adopted this method of treatment for bites of venomous snakes in India, it proved a failure. Sir Joseph Fayrer also found by experiment that mixing ammonia with snake venom, before injecting it into an animal, in no way delayed the fatal result. Therefore, ammonia cannot be regarded as a specific for the bites of venomous snakes, but its intravenous injection may be employed in conjunction with other measures.

Aqua ammoniæ forms the active ingredient of many liniments. As equal parts of aqua ammoniæ, tinct. opium, and sweet oil. The following is used largely at the University Hospital: ℞. Tr. aconit. rad., fʒss; chloroformi, fʒij; aq. ammoniæ, fʒss; ol. olivæ, fʒv.

Diseases of the Throat, etc.—Water of ammonia (sp. gr. 960) added to an equal quantity of water is recommended by M. Mackenzie as a stimulating inhalant. Ammonia enters largely in the "Hagerbrand Anti-catarrhal Remedy;" or the following may be substituted: Equal parts of water of ammonia, magnesia, and water are mixed to make an ounce. A teaspoonful is added to a pint of water at 80° F. To be used as an inhalant in CHRONIC LARYNGITIS.

"MEDICATED BATHS."*

Diseases of the Skin.—The following diseases are those in which baths may be employed at times with advantage: ERYTHEMA, URTICARIA, ECZEMA, PEMPHIGUS, LICHEN RUBER, PRURIGO, PSORIASIS, PITYRIASIS RUBRA, DERMATITIS, ICHTHYOSIS, SCLERODERMA, and the neuroses of the skin, particularly PRURITUS.

Parasiticides act favorably in the form of baths in TINEA TRICOPHYTINA and in TINEA VERSICOLOR, also in SCABIES. When used in PEDICULOSIS VESTIMENTORUM baths are chiefly useful as antipruritic.

The following formulæ for the more commonly employed baths may be given here. The temperature of these baths should not, it is understood, vary much above or below 90° F., and since to obtain their full effect baths must often be prolonged to half an hour, or even an hour, the temperature should be kept up by successive additions of hot water, and the room in which the patient takes his bath should be kept at an even warmth. Evening is the best time in general for taking medicated baths, and the patient should be warned against going into the bath soon after a hearty meal.

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* For Baths, see p. 98.

The medicated baths commonly employed in diseases of the skin are the following:—*

The Acid Bath:—

℞.	Acidi nitrici fort.,	f℥iss	
	Acidi hydrochlorici fort.,	f℥j	
	Aquæ,	C. xxx.	M.

Employed in PRURITUS, URTICARIA, and PAPULAR ECZEMA.

The Alkaline Bath:—

℞.	Sodii carbonat.,	℥iv	
	Aquæ,	C. xxx.	M.

Another is as follows:—

℞.	Potassii carbonat.,	℥iv	
	Sodii carbonat.,	℥iij	
	Sodii biborat.,	℥ij.	M.

One such powder is to be used in a thirty-gallon bath, with half a pound of starch, the latter previously boiled with water to make a "clear starch."

Employed in ACUTE ECZEMA, URTICARIA, ERYTHEMA, PSORIASIS, and ICHTHYOSIS.

A formula employed for children is as follows:—

℞.	Sodii biborat.,	℥j	
	Sodii carbonat.,	℥ij	
	Potassii carbonat.,	℥iij.	M.

Two to four teaspoonfuls of this powder for every gallon of water, with double the amount of dry starch.

The Creasote or Carbolic Acid Bath:—

℞.	Creasoti (*seu* acid carbolic),	f℥ij	
	Glycerini,	f℥ij	
	Aquæ,	C. xxx.	M.

This is employed in PRURITUS and in certain forms of SQUAMOUS ECZEMA.

The Sulphur Bath:—

℞.	Potassii sulphuret.,	℥iv	
	Aquæ,	C. xxx.	M.

This is employed in PSORIASIS, PITYRIASIS, ACNE, and IMPETIGO, and as a specific in SCABIES. Another formula is the following:—

℞.	Sulphur. precipitat.,	℥iv	
	Sodii hyposulphit.,	℥j	
	Acid. sulphuric. fort.,	f℥j	
	Aquæ,	C. xxx.	M.

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* Not to be used in a metal-lined tub.

This last is employed exclusively for SCABIES.

The Sublimate Bath :—

℞.	Hydrarg. bichlor. corrosiv.,	℈ij
	Ammonii chloridi,	ʒiiss.
	Aquæ,	f℥iiss. M.

Put in a bath of thirty gallons.

This is sometimes employed in PRURITUS, but we should doubt the advantage of its employment. It is better adapted to SYPHILIS.

The sublimate baths which are so useful in INFANTILE SYPHILIS are composed of ten grains of bichloride of mercury to each bath, in a child's bath-tub. A cloth or blanket should be tied around the child's neck and spread over the tub, so that none of the solution shall be splashed into mouth or eyes.

Tan baths, containing a handful of tan bark to each bath, have been recommended in PURPURA.

Tar baths are employed by rubbing tar into the diseased parts of the patient's skin, and then employing an ordinary warm bath. They are used in PSORIASIS.

The baths connected with mineral springs possess little or no virtues in the cure of skin diseases, other than those possessed by the water which they contain.

OLEUM PINI SYLVESTRIS. Pine-needle Oil.

This oil is distilled from the small branches of *Pinus sylvestris*, and other species of pine growing in Europe. In some of its properties it resembles ordinary turpentine oil, but possesses a more refined and agreeable odor, owing to its containing oxygen compounds of high boiling-points. According to Atterberg, oil of *Pinus sylvestris* may be separated into three fractions: (1) Ordinary turpentine oil, (2) sylvestrin, and (3) a strongly aromatic, high-boiling compound of a very characteristic odor. In the light of more recent investigation, this last fraction consists of one or more compound ethers of borneol.

Owing to the scarcity of the true product from *Pinus sylvestris*, chiefly on account of its increased use in influenza, the oils from *Pinus Pices* and *Pinus Pumilio* have been more or less substituted. It is probable, however, that the composition of the substitutes closely resembles that of the true oil. The latter is known in Germany as *Fichtennadelöl.*

OLEATUM ZINCI. Oleate of Zinc.

Oleate of zinc is best prepared by dissolving, with the heat of a water-bath, oxide of zinc in oleic acid. When made of five per cent. strength, the product is a soft solid. When made with twenty per cent. of oxide, it is hard and friable, but transparent when melted. The Br. Ph., directs that one part of the oxide be dissolved in nine parts of oleic acid.

The National Formulary directs it to be prepared by precipitating a solution of Castile soap with a solution of acetate of zinc. The product contains about thirteen per cent. of zinc oxide, and is in the form of a white powder, insoluble in water and in alcohol.

Diseases of the Skin.—Oleate of zinc was suggested as a remedy in Eczema and other Inflammatory Skin Diseases by Marshall, of London. The formula is herewith given: ℞. Zinci oxidi, ʒj; acidi oleici, ℥j; vaselini, ʒix. M. The oxide of zinc is to be rubbed up with the oleic acid and allowed to stand for about two hours. The mixture is then placed in a water bath until the oxide of zinc is dissolved, when the vaseline is added and the mixture is stirred until cold.

If we have the oleate already prepared, the following formula is a good one: ℞. Zinci oleat., ʒj; vaselini, ung. aq. rosæ, āā ℥ss. M.

Diseases of the Ear, etc.—Oleate of zinc is recommended by H. McNaughton Jones as the basis of an ointment in the treatment of Eczema of the Auricle.

SODIUM ETHYLATE.

The liquid sodium ethylate becomes solid on cooling, and contains alcohol, which it loses at 200° C. It is rubbed to a fine powder, and preserved in a well-stopped bottle. In contact with water it is decomposed into alcohol and sodium hydrate. Richardson's sodium ethylate is a solution of one part of the above compound in three parts of absolute alcohol. (See p. 408.)

“STENOCARPINE.”

A preparation under the name of Stenocarpine, or Gleditschine, was, a few years ago, one of the most ambitious of the rivals of cocaine, and was tested and written about by a number of well-known authorities. John Marshall, Demonstrator of Chemistry in the University of Pennsylvania (*Phila. Med. News*, October 29, 1887), showed that it was a fraudulent mixture of atropine and cocaine.

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